AGRICULTURAL AND MINERAL PRODUCTION

IN

JAPAN

By

E. F. PENROSE

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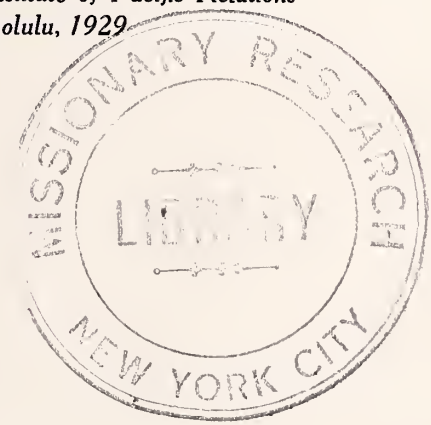

ADVANCE PROOF

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Nagoya Commercial College
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PREFACE

My thanks are due to Dr. J. B. Condliffe for first suggesting the publication of this material in book form instead of in the form of scattered articles, and to the Institute of Pacific Relations for making this possible; to Mr. Y. Yamada, Secretary of the Commercial Research Bureau of the Nagoya Commercial College for executing (after the preliminary plotting) the majority of the charts in the food and agricultural sections; to Mr. N. Takegawa, late of the same Bureau, for the mineral charts and some help in the early stages of the calculations; to Mr. R. Murakami and Mr. S. Nagai of the Ministry of Agriculture, and to Mr. Yoshino, Director of the Bureau of Industries in the Ministry of Commerce and Industry and Mr. Kazahaya of that Ministry, for supplying data from the records of the Ministries for several commodities in the earlier years of the periods dealt with, such data being unobtainable in current publications; to Mr. Watanabe of the Government General of Korea for data relating to food exports from Korea to Japan proper; to Professor Amemiya, of Tokyo Imperial University, for advice on the reclassification of Japanese fish here adopted as convenient for the fisheries index; to Mr. Kuriyama of the Customs Department of the Ministry of Finance for assistance in tracing data for the earlier years on food imports from foreign countries; and to Mrs. E. B. Hussey of Tokyo, for assistance in preparing the manuscript.

Originally I prepared some portions of the statistics in this study for publication in the Japanese language in the form of reports issued by the Commercial Research Bureau of the Nagoya Commercial College, the translations being carried out by Mr. N. Takegawa, and Professor K. Kohri. Two reports appeared in this way under the titles "Hompo Nosambutsu no Seisan Suryo Shisu ni tsuite," and "Nihon Kosambutsu no Seisan Suryo Shisu." A third study appeared among a collection of essays in the seventh volume of "Shogyo Keizai Ronso," under the title "Nihon ni okeru Dobutsu rui Shokuryohin no Seisan," the translation into Japanese being in this case carried out by Mr. Y. Yamada.

The present study, however, largely supersedes these just mentioned above. Extensive additions have been made to the statistical materials and the descriptive and interpretative parts have been entirely rewritten.

In commenting on the bearing of the present study on fiscal policy I have used a few passages from an address which I gave before the Nagoya Chamber of Commerce on May 7, 1928, and which was subsequently published in English and Japanese by the Japan Federation of Liberty of Trading Associations.

E. F. Penrose.

Nagoya Commercial College, Japan, July 25, 1929.

CONTENTS

AGRICULTURAL AND MINERAL PRODUCTION IN JAPAN

CHAPTER I

INTRODUCTION

This study aims at tracing the relative growths in Japan of population, domestic food production, food imports, agricultural production and mineral production. In the fields covered it contains the most extensive collection of figures of production to be found in any one book in any language. Such a collection in its original form is somewhat bewildering in range and complexity. Hence to manufacture the raw data into serviceable instruments for economics and business students the device of index numbers of production has been used. A base has been selected, represented by 100, and relatives have been calculated for each commodity coming into the scope of the study, covering the periods which it was found practicable to deal with, having regard to the limitations of available data. Averages of these relatives have been taken to form group indexes, in food and agriculture for cereals, fishery products, animal foodstuffs, potatoes, beans, vegetables, fruit, industrial crops: in mining for metallic and non-metallic minerals: while in respect of food imports three indexes show the respective growths of imports from foreign countries, from Korea, and from Formosa. Averages of the appropriate group indexes have been calculated to form indexes of total domestic food production, of food imports from all sources, of all agricultural production and of all mineral production. Each of these final indexes has been shown in comparison with a population index.

The following publications have been used as sources of data: No Rin Sho Tokei Hyo, Sho Ko Sho Tokei Hyo, Beikoku Tokei Nempo, The Annual Returns of the Foreign Trade of the Empire of Japan, Returns of the Trade of Taiwan, 1896-1925, Dai Nihon Gaikoku Boeki Go-ju-roku nen Taisho Hyo (a most valuable work published by the Oriental Economist), Nihon Teikoku Tokei Nenkan, and Nihon Teikoku Tokei Zenshu.

Some data relating to earlier years in the periods dealt with and data relating to Korea could not be obtained in complete form in any publication extant and were obtained directly from the records of the Statistical Departments of the Ministries concerned. Acknowledgments to those who made this possible are made on another page.

Some readers may be surprised that a more detailed attempt at interpretation of the results obtained is not made here. The explanation is twofold. First, the publication of this study has been hastened in the hope that the data in it may be available in time for the Conference of the Institute of Pacific Relations commencing at Kyoto near the end of October this year

(1929). The manuscript is being dispatched less than a week after the completion of the final calculations. Secondly, the writer feels that in any case these data should be made public as soon as possible. Judging from inquiries received, many students of economics and business who cannot consult statistical works written in Japanese are likely to find useful information here. Quantitative data on Japanese conditions are not easily obtainable by foreigners living in other countries—or even in Japan for that matter—and a student who, like the present writer, unearths an extensive collection of data, can perform a better service to economic scholarship by instantly making them available than by hoarding them up until he has subjected them to a microscopic examination in the hope of confirming or rejecting important generalisations by their aid. There may be others more competent to undertake the latter task than the original compiler of the data.

No claim is made in this study to a solution of the population problem of Japan. No would-be interpreter can hope to reach a solution by a study of these data alone. Still, it is not too much to say that the quantitative background shown in this study is an essential part of the scientific approach to that group of problems loosely designated as the population problem: while unaided it cannot solve that problem, no attempt at a solution can afford to ignore it.

In view of the extraordinary interest shown in Japan in the population problem, beside which the discussion in England in the time of Malthus appears to have been a very small affair, it is a little surprising that a more intensive study has not been made of such quantitative data as may have some bearing on the problem. Quantitative study has by no means been entirely neglected, but there is a large field as yet little worked over. Deficiencies of data are serious, yet more is available in the Japanese language than is sometimes imagined by Western writers on Japan, some of whom have exaggerated the paucity of the data in existence.

The explanation given of the statistical methods used may seem superfluous to some readers. It arises from an effort to place all the cards on the table and make the work intelligible to all readers. Professional students of statistics can omit part of Chapter III.

CHAPTER II

SOME USES AND LIMITATIONS OF PRODUCTION INDEXES

Mr. W. T. Layton, the Editor of the *London Economist,* says: "An index of production is one of the first steps which we need to take in the diagnosis of the economic situation of a country."

Sir Josiah Stamp declares that "the time is fast coming when people will realise that this index is an essential feature of national life."

Mr. J. W. F. Rowe, speaking in reference to England, said: "It is little short of a national disgrace that this vital statistical measurement has not been supplied long ago."

The above statements by eminent economic authorities were not made with any special reference to Japan. But they contain more than average significance for Japan in its present economic situation. "The diagnosis of the economic situation of a country" is of paramount importance when that country consists of a group of small islands, constituting one of the most densely populated regions of the world, and when, emerging suddenly from medieval feudalism, it doubles its population in half a century, and is transformed into a modern state with an important industrial as well as agricultural organisation.

Up to the present, in Japan as in other countries, the study of prices has received much more attention than the study of production. When there has been a lack of data on production attempts have sometimes been made to infer relative amounts of production at two different points of time from relative prices, or relative values of goods produced or imported or exported. This is the method adopted in England by the Board of Trade for the purpose of comparing the relative volumes of foreign trade at different periods. It is a thoroughly unsatisfactory method, even when values have been corrected by reference to wholesale price index numbers to eliminate the effects of currency fluctuations as far as possible. The reliability of these calculations by the Board of Trade is highly problematical. The conclusions reached are altogether inferior to those obtained by an index of the volume of production when the materials for such an index are available.

Index numbers of production are less familiar but not less important than index numbers of prices. Their purpose is to compare the actual physical volume of goods produced within a given area at different periods of time. The value in terms of goods of a unit of currency is subject to fluctuation and the money value of the output of an industry often gives no indication of the actual condition of production. The index number of the physical volume of production is designed to pierce the veil of money and to lay bare the relative amounts of production of physical commodities at different periods.

The importance of the index number of physical production is steadily

gaining recognition in the United States and Great Britain. Mr. Edmund E. Day and Mr. J. W. F. Rowe have constructed indexes for these two countries respectively, Mr. Day's work having been published by the Harvard Review of Economic Statistics and Mr. Rowe's by the London and Cambridge Economic Service. Other indexes have been constructed in North America, and in England on January 18, 1927, Mr. A. W. Flux, Director of Statistics in the Government Board of Trade, announced that the Board had decided to compile an official index of production for Great Britain.

It seemed therefore to the present writer that the time was not only ripe but overdue for an attempt to construct production indexes for Japan. This attempt is, however, limited to agriculture, fisheries and mining. A considerable quantity of data on manufacture exist but as yet no census of production has been taken. Hence knowledge of the values of net products added by manufacture are not obtainable and no satisfactory basis exists for assigning weights to the outputs of different industries. A census of manufactures is due shortly and the writer hopes to construct a manufacturing index as soon as the results are available.

A knowledge of the course of production may be desired (1) for immediate practical business purposes; for example as an aid to forecasting the probable state of the market in the near future and thus assisting firms to form their price and output policies; (2) for what cannot be better expressed than in Mr. Layton's words—"the diagnosis of the economic situation of a country."

For the first of these objects a monthly as well as an annual index is desirable. It is hoped to take this matter up in a future study. Meantime, while the present study may not be valueless for practical business problems, it is the second of the objects that has chiefly inspired its production.

It is sometimes imagined that a knowledge of the course of production over a considerable period of time will supply the answer to the question whether a country is over-populated or not. For instance in the Annual Commercial Review of the *Japan Advertiser* for 1929 a contributor states confidently that "Figures Reveal No Surplus of Population in Japan." As a headline this is a little ambiguous, but in another setting the article is headed "Japan is not Over-populated." The writer of the article makes some rough comparisons between the growth of population and the growth of a number of commodities. As I have shown elsewhere his statistics of production contain very serious inaccuracies in places and his deductions do not follow logically from a very close examination of his data in certain respects. This, however, is beside the point here. Even if we prove that in a given country the production of all physical commodities has increased faster than population over a certain period of time, it does not follow that the country is not over-populated. It is quite possible that per capita production would be still greater if population were at a lower level than it actually was at any point in the given period. The mere fact that per capita production is increasing in

a given area is no proof that over-population does not exist. If we could prove that per capita production in Japan has steadily risen during the period in which population has increased from 30 millions to 60 millions, it would nevertheless be quite conceivable that per capita production would be higher still if the population were 20 millions.

This scepticism must be carried still further. The study of the production of physical commodities alone cannot, at least in modern economic organisations, lead to a conclusive answer to the question whether a country is over-populated or not. Welfare is not maximised by the consumption of physical quantities alone. Economists do well to speak, not of goods alone, but also of goods *and services*. And these services cannot all be brought within the same kind of measure that we apply to the production of physical commodities, if indeed in certain cases they can be brought within the scope of any physical measurement at all.

Having emphasised these limitations we must not pass to the opposite extreme and conclude that the study of physical production is without value in the study of the population problem. It is by the production of physical commodities that the basic needs of food, shelter, and clothing are provided for. And though the changes in per capita production do not settle the question whether a country is under-populated, over-populated, or at the optimum, yet they do, when studied in conjunction with other factors, form a part of the total knowledge required to settle the question. No adequate tests, quantitatively applicable, of over-population and under-population, have yet been devised, but it is unlikely that any successful tests that may be devised in the future will be able to dispense with a knowledge of relative physical production at different times. Even now, as Dr. Hugh Dalton has pointed out, a decline in per capita income is a more serious ground for suspecting over-population than is an increase in per capita income for suspecting that there is no over-population. What is true of income in this sense is in many cases true of physical production.

Comparisons of relative production at different periods have one advantage over comparisons of relative income. Apart from the fact that they eliminate the effects of monetary fluctuations, they also reduce the influence of exchange value and what C. M. Walsh calls esteem value, and show more clearly the *use* values resulting from the economic efforts of a community. It is true of course that the production of physical commodities is largely guided by exchange values. Still, amounts of production do give us the best basis for determining use values. A Japanese in poor economic circumstances will eat a considerable amount of barley; if his income increases he will substitute rice for barley. Yet food chemists have shown that rice is inferior to barley in protein content and having regard to Japanese diet as a whole it would be much better if Japanese people consumed more barley and less rice. In Japan, as between rice and barley exchange value and use value vary more or less inversely. So far as increased income is used for substituting rice for

barley it actually diminishes welfare. Production indexes give us, however, some clue to the relative use values of the commodities produced at different times; income statistics do not. The use values of commodities consumed are a better indication of welfare than the conventional estimates influenced by custom and prejudice.

It cannot, however, be claimed that the influence of exchange values is entirely eliminated from this study of production. Weighting is determined by relative money values of amounts produced in the base period. Dr. Nasu, the eminent Japanese agricultural expert, suggested recently to the present writer that he should construct other food indexes in which food calories, instead of exchange values, should be taken as the basis for determining weights. This suggestion came too late to follow up in the present study. It raises an extremely important point. On the food problem no index could be more important than one which shows the changes in the total nutritional value of the food produced at different times. Taking calories as the basis it would be possible to compute the value from this standpoint of the quantities of foodstuffs produced, and to aggregate the values for the different foodstuffs and construct indexes or series of relatives showing the total number of food calories produced from all foodstuffs in different years over a selected period. Unfortunately the caloric basis would be a very imperfect measure of nutritional value. Knowledge of nutritional factors is still imperfect, but what has been established is somewhat complex. There is a minimum protein requirement, a minimum carbohydrate requirement, an approximate ratio between amounts of protein and carbohydrate, a minimum requirement of fat (though some difference of view exists on the interchangeability of carbohydrate and fat): there are four or five accessory factors, known as vitamins; and the acidity or alkalinity or neutral nature of the ash must be taken account of. It would be difficult to devise a simple numerical measure that would take account of all these factors. Next, there is often a considerable difference between the nutritional value of food in the hands of the producer and food in the mouth of the consumer, though this fact would not destroy the usefulness of an index that took account only of the former condition of the food.

On the whole, providing its limitations are realised, an index based on food calories may be worth constructing as a provisional measure pending the development of a more inclusive method. This study, however, bases its weighting on exchange values, which are influenced by needs based on custom and convention as well as those scientifically justifiable.

We turn now to a second aspect of the food and population problem on which the present study has considerable bearing. When transport and communication are primitive and undeveloped, judged by modern standards, the food problem far overshadows every other aspect of the population problem. The same thing is largely true of modern communities at war, even when they have well developed transport systems in normal times. It was true of

England during the Napoleonic Wars, of Ireland during the famines of the forties, of most powers during the Great War, and of the Eastern part of the Russian wheat belt in 1921. When transport and communication are well developed, and when international peace prevails, the relation of population to food is less urgent than its relation to national income resulting from industrial and commercial as well as agricultural enterprise. As an alternative to producing all its food supply at home a country may obtain a part of its food supply from other parts of the world, paying for it with raw materials or manufactured articles which it can produce at prices able to meet competition in the world market. This development of world division of labor makes possible in some countries, notably in England, a far higher standard of living than could possibly be attained if reliance had to be placed exclusively on domestic sources of food production.

A knowledge of the physical volume of domestic food production on the one hand and of food imports on the other hand make it possible to trace any existing tendency in a country to pass from reliance on domestic food production alone to dependence on other countries for a portion of its food supply. This knowledge is of the greatest importance because of the bearing of any such transition on the fiscal policy of a country. The transition will be hindered by a protectionist policy and stimulated by a free trade policy. A protectionist policy may check a fall of agricultural incomes but will raise or keep up the price of food, thus adversely affecting the working classes and keeping up industrial costs of production higher than they would be if food were cheaper. A free trade policy may cause agricultural incomes to fall for a time and necessitate a reorganisation of the agricultural system in the country. And if, in the earlier stages when domestic food production is adequate, a policy of protection in respect of manufactured products is followed, it will be difficult to resist the plea of agriculturalists for protection when, later, food imports are tending to increase; unless indeed a general movement towards free trade is initiated, as was the case in England in the nineteenth century.

Japan is an island country, or a country of islands. Like England, it is situated near a large, and in places densely populated land mass. Like England it is one of the most densely populated regions in the world. Will Japan pass through the same stage of economic transition that England passed through in the nineteenth century? Is there already a measurable tendency in that direction? Should the present fiscal policy of Japan be modified to meet a changing situation?

These questions give an adequate reason for attempting the present study.

CHAPTER III

SOURCES AND METHODS[1]

The first step in the construction of the index numbers is to secure as reliable data as possible of the actual quantities of production of the commodities that come within the scope of the inquiry. In the case of agriculture the figures of production in Japan are compiled by the Section of Statistics of the Ministry of Agriculture and Forestry. Headmen of towns and villages are put in charge of the inquiries in their respective districts. Each headman divides his district into a number of parts and appoints an inquirer for each part. Each inquirer, soon after the planting season for a crop is ended, either sends a questionnaire to each farmer in his district requesting him to declare the area which he has planted, or visits the farmer and obtains the information orally or makes a direct inspection. He later decides on a piece of representative land for each crop, taking into account harvest times and general conditions of growth. In due course he reaps or collects the produce of one tsubo (3.3 square metres) and multiplies the product of this acre by the number of acres planted with the crop, after subtracting for any part of that area which may have failed. In addition, either by personal inquiry or by questionnaire, he requires each farmer to state the amount and value of the crop which he has produced. In the case of animals and animal products direct inquiry is made of farmers. Having collected the required data by these means the inquirer sends in a report to the headman of the town or village; the headman, after collecting the reports of all the inquirers in his district, sends them to the Governor of the Prefecture in which his town or village is situated. The Governor of the Prefecture, after collecting the reports of all the headmen in his prefecture, coördinates them and sends them to the Ministry of Agriculture and Forestry, where the Section of Statistics arranges them in tables relating to the whole country.

In the case of fisheries, the information is obtained by the inquirers from fisherman, fishery associations, coöperative selling stores, and at landing places. In the case of mineral products data are obtained directly from the mining companies by the Mining Bureau of the Department of Commerce and Industry.

In statistical circles some scepticism has been expressed in England as to the reliability of the results obtained from the crop estimates of the English Ministry of Agriculture. Mr. J. A. Venn and Mr. G. Udny Yule were responsible for the most important of these criticisms, and on November 15, 1927, Mr. H. D. Vigor, the Chief Statistician of the Ministry of Agriculture, read a paper before the Royal Statistical Society, in which he replied to the criticisms and vigorously defended the methods used. An interesting discus-

[1] It will be obvious to statistical readers that I am much indebted to the Harvard Review of Economic Statistics and particularly to Professor Edmund E. Day for the technique of production indexes here adopted.

sion followed, and as many of the points discussed are relevant to the methods used in Japan, the whole discussion should be read by those interested in the subject in relation to Japan.

Having secured the separate amounts of production of each crop or fish or mineral during the periods for which data exist, we are confronted with a bewildering mass of figures. These may be regarded as the raw material of our work which must be manufactured into index numbers.

First, we have to decide whether to include all crops, all fish, or all minerals, as the case may be. In general the total values in recent years of the amounts produced have been taken as the criterion of selection. All commodities whose average total values in the years 1921-1925 exceeded one million yen have been included, and those below that limit have been rejected.

In dealing with agriculture one year alone should not be taken as the base, because of harvest fluctuations due to climate. In this study an average production over five years has been taken as the base period. It is necessary to know the values as well as the quantities for the base period, for the purpose of computing weights. In the case of most of the commodities dealt with here no statistics of values were compiled in Japan before the year 1915. Hence the choice of the base period was strictly limited to the period 1915-1927. When the calculations were started the figures for 1927 were not available, and in the case of some commodities those for 1926 have not appeared. The war years were excluded because of the exceptional conditions which then prevailed and it was decided to take an annual average for the five years 1921-1925. The annual average production in these years was then computed for each of the commodities dealt with and represented by 100. The production in each of the other years in the period was then expressed, as a percentage of the base.

It will be seen that in each group of commodities two tables are given, the first containing the figures of production and the second the series of corresponding relatives expressed in terms of the base. These relatives, unlike the original data, do not represent absolute amounts but only relative amounts at different times. For the purpose of representing comparative amounts they are much superior to the original data, because they substitute for the latter simpler and lower figures, the significance of which can be comprehended at a glance. Moreover, the fact that these comparative figures are pivoted around a given base represented by 100 enables a given point to be fixed in the mind's eye and changes to be pictured as so much below or above that point.

What we can do at this stage is to recognize at a glance the relative amounts of production of any one product at two different points of time within the period dealt with. But in addition we often require to know the relative amounts of production of groups of commodities. For example we require in agriculture to know the relative amounts for cereals as a whole, vegetables, fruits, and so on. Finally we wish to have a series enabling us to compare total agricultural production at different times. Such comparisons cannot be made from an examination of the separate series showing the rela-

tive productions of individual products. It is true that an approximate idea may sometimes be formed in this way, but it will be extremely hazy and inexact and therefore unreliable for scientific purposes.

It appears to be a simple answer to say that an average of the figures for each separate agricultural product should be taken to represent agricultural production as a whole. But the question arises, what kind of average is best suited to the purpose in hand? Space cannot here be taken up with a detailed discussion of the respective merits and defects of the different kinds of average. In the index numbers here constructed the geometric average has been chosen, because among other merits it has the outstanding advantage for the present purpose in that it enables the base of the index number to be shifted at will. This property of the geometric average facitilates comparisons between production and population in the present study.

The simple unweighted geometric mean is expressed by the following formula:

$$GM=\sqrt[n]{a_1 \times a_2 \times \ldots\ldots a_n} \quad \text{or, expressed logarithmically}$$

$$GM={}^1/_n \, (\log a_1+\log a_2 \ldots\ldots\ldots +\log a_n)$$

where a_1, a_2 .... a_n are the quantities to be averaged and **n** their number.

The next question is, what relative importance shall be given to each separate commodity in the process of average? The relatives to be averaged indicate comparative quantities and not absolute amounts. Each year in Japan there is a large production of bituminous coal and a very small production in lignite. Suppose the figures for the former, represented by relatives, jumped from 100 to 150 and of the latter from 100 to 200. In averaging it would be obviously ridiculous to attach as much importance to the latter rise as to the former. Yet the unweighted mean would actually attach greater importance to the rise in the initially very small production of lignite than to the rise in the bituminous production.

Weights have been assigned to each product according to the average annual values of the production in the base period, expressed in millions of yen to the nearest million.

The generalised formula for the weighted geometric mean is as follows:

$$GM=\sqrt[w_1+w_2+\ldots\ldots w_n]{a_1^{w_1} \times a_2^{w_2} \times \ldots a_n^{w_n}}$$

or, logarithmically,

$$GM=\frac{w_1 \log a_1+w_2 \log a_2+\ldots\ldots\ldots w_n \log a_n}{w_1+w_2 \ldots . w_n}$$

where a_1, a_2....a_n are the quantities to be averaged, **n** the number of such quantities and w_1, w_2....w_n represent the weights respectively assigned to a_1, a_2....a_n.

This formula is the one which has been employed in this study to construct from the relatives representing comparative production of individual commodities at different times, group indexes for cereals, vegetables, fish, animal foodstuffs, industrial crops, etc., and comprehensive indexes for agricultural, food, and mineral production and food imports.

CHAPTER IV

THE FOOD INDEX

The index of the physical volume of domestic food production in Japan is divided into the following groups: cereals, animal foodstuffs (including fish), vegetables, potatoes, beans, fruit, tea.

Unfortunately the length of time over which the data exist varies in different groups. Hence three separate final indexes have been constructed, one extending from 1894 to 1927, and including cereals, fish, potatoes, beans, and tea; the second extending from 1905 to 1927 and including cereals, animal foodstuffs (fish, meat, eggs and milk), and the third extending from 1909 to 1927, including all the foregoing with vegetables added.

For each group two tables are shown, the first giving the actual amounts of production and the second the corresponding relatives calculated with reference to the base, 100, representing the average production of the five years 1921-1925. In the case of vegetables the year 1920 has been substituted for 1921 on account of deficiencies of data for 1921. The same course was followed in the case of fruit on account of exceptional circumstances.

An examination of the products in the different groups shows that Japanese agriculture differs in many respects from that found in Western countries. The extraordinary preponderance of rice in the cereal group and indeed in the food index as a whole cannot fail to attract attention. In the cereal group in Japan rice receives a weight of 1952; next comes naked barley with 97, wheat has 89 and barley 85; the others are of little importance. In Mr. Edmund E. Day's index for the United States corn comes first with 1563 (millions of dollars), wheat second with 600, oats third with 425, barley fourth with 108. Even corn has no such preponderance over other cereals in America as rice has over other cereals in Japan. Moreover corn, the most valuable crop, is to a much greater extent used as food for animals rather than as food for human beings. It does of course enter very largely into human consumption, but most of it only after having been changed into meat. In Japan there is no correspondingly large crop used to feed animals, almost all the rice being directly consumed by the people.

Fish is by far the most important animal foodstuff consumed by Japanese people and the consumption of meat is extraordinarily small. This has an important bearing on the qualitative food problem in Japan, and will be referred to again.

Data for vegetables are unfortunately far more limited than data for other groups. It is unfortunate that gaps exist for the years 1915, 1916, 1918, 1919, and 1921.

The separation of potatoes and beans from the vegetable group may be challenged. This step has been taken on qualitative grounds. Beans are pri-

marily a source of protein, and potatoes primarily a source of carbohydrates. The vegetables in this group here constructed are primarily of value because of the mineral salts and vitamins they contain, and because of their alkali value. Of course beans are not without carbohydrates, potatoes not without protein, and so on. But each has a predominating factor and it is on this basis rather than on the conventional and customary basis that the classification is here made.

It may be argued that tea has no food value. In the Far East it fulfils a very important function, however, since the majority of people are dependent on well water, much of which is polluted. The necessity of boiling water to make tea provides a pure drink for large masses of people many of whom, from ignorance of hygiene, would not trouble to boil water if water were the drink instead of tea.

TABLE 1. COASTAL FISHERY PRODUCTS. QUANTITIES CAUGHT.

	Sardines and Anchovy	Cuttle Fish	Sea Bream	Herrings	Yellow Tail	Mackerel	Bonito	Tunny	Flatfish	Prawns and Shrimps	Cod	Horse Mackerel	Oncorhynchus Keta	Eels	Grey Mullets	Laminaria	Cybium	Japanese Smelts	Sea Ears	Shark	Skipper	Oncorhynchus Masou	Carp	Gelidium	Flying Fish	Sea Cucumbers
Wolght[1]	30	23	22	17	11	10	10	8	7	7	5	5	5	5	4	4	3	3	3	2	2	2	2	2	1	1
Base[2]	120,737	38,811	6,250	112,731	5,226	15,142	6,131	3,319	9,773	4,531	23,326	4,610	3,313	1,010	1,946	40,040	1,261	623	1,446	2,912	2,687	3,182	718	1,429	2,024	1,735
1894	57,112	8,886	5,488	3,241	3,817	6,602	9,151	3,813	3,491	4,893	2,012	2,055	1,133	238	.....	611	1,012	765	1,274	1,098	1,176	139	.....	1,208	325	765
1895	54,310	9,187	4,879	1,970	4,002	6,788	8,970	3,891	3,706	4,156	1,149	2,486	567	320	6,790	484	1,167	585	767	1,148	930	72	202	929	728	547
1896	48,538	11,523	5,277	1,966	3,816	6,510	9,070	4,842	2,226	3,440	728	1,915	617	363	1,566	343	1,111	775	971	1,111	1,474	141	129	886	410	562
1897	38,353	10,102	5,000	1,655	3,491	5,790	7,736	4,893	3,457	3,695	785	2,162	718	376	.....	909	995	818	764	1,321	402	97	123	705	417	505
1898	36,537	8,386	4,673	1,593	3,301	6,445	9,061	3,344	2,825	3,456	665	1,911	525	539	1,591	337	1,098	1,030	697	1,328	77	89	189	461	527	527
1899	48,492	8,688	4,348	835	3,771	5,584	9,689	2,890	3,350	4,588	1,467	2,436	966	696	.....	1,207	1,044	524	1,019	1,248	52	81	112	686	343	504
1900	48,596	8,861	5,566	375	5,437	7,513	10,991	3,926	3,036	4,200	1,072	2,270	665	1,024	1,575	339	1,245	586	843	1,182	137	95	128	888	1,260	664
1901	54,115	11,490	4,783	237	5,399	6,391	9,283	3,575	3,257	4,027	845	2,486	1,291	491	1,835	528	1,322	642	1,029	1,299	327	113	133	787	593	516
1902	62,218	12,297	4,466	255	3,559	5,946	9,200	3,027	2,941	4,078	755	3,194	687	406	1,438	389	1,087	577	837	1,244	579	111	139	1,310	606	655
1903	33,489	12,317	4,328	489	3,680	6,483	7,179	2,222	2,946	4,280	830	2,272	650	432	1,583	389	1,081	523	927	1,010	819	135	147	1,510	626	615
1904	39,657	11,073	4,338	264	3,650	6,315	8,417	1,967	3,246	3,470	1,582	2,981	426	483	1,562	655	898	520	781	1,184	1,574	115	233	695	714	646
1905	40,397	9,489	4,340	1,580	3,554	5,070	11,185	2,849	4,236	5,122	2,120	2,761	911	812	1,520	6,196	1,123	418	929	970	202	267	640	743	1,169	676
1906	37,858	11,241	4,739	1,778	4,700	4,524	11,663	2,724	5,551	4,662	1,757	2,691	1,180	679	1,328	7,652	1,097	478	1,004	974	906	325	463	840	1,575	641
1907	42,336	12,812	4,629	1,472	4,962	4,785	8,808	2,733	4,964	1,585	3,568	2,833	1,114	645	1,466	5,947	1,305	523	899	1,101	1,997	540	390	819	1,899	684
1908	42,620	9,463	4,950	2,379	6,004	4,837	13,361	2,976	5,073	4,072	5,392	2,906	838	615	1,427	4,921	1,160	592	812	977	1,676	669	454	790	4,592	919
1909	45,916	10,368	4,840	5,038	4,953	6,856	13,741	3,956	4,400	3,610	3,832	3,390	768	676	1,631	6,320	1,119	704	981	1,338	3,946	865	560	919	990	1,310
1910	49,694	12,934	5,230	51,708	4,690	7,649	11,038	3,673	6,593	4,324	15,133	3,227	2,663	726	1,737	7,126	1,129	755	1,434	1,550	3,721	3,297	718	1,164	1,540	1,094
1911	49,815	14,627	5,371	72,950	5,185	8,001	13,192	4,262	11,305	6,041	13,400	3,121	3,981	750	1,650	10,685	1,142	748	1,276	1,694	4,353	5,848	809	1,603	1,455	2,106
1912	67,037	21,932	5,375	66,776	5,977	8,936	13,298	3,205	14,137	6,125	17,263	3,163	3,173	736	1,487	13,095	1,370	770	1,091	2,938	15,952	5,285	801	1,329	1,766	1,123
1913	71,553	24,760	5,737	107,874	6,560	9,138	11,275	3,776	13,179	5,965	17,637	2,904	2,262	703	1,540	13,601	1,328	900	1,278	1,783	9,354	9,014	767	1,306	1,702	1,401
1914	84,500	31,818	5,166	108,257	6,129	9,854	14,338	4,374	10,280	5,750	16,911	2,843	2,018	703	1,454	11,568	1,095	797	1,168	1,513	5,184	2,352	865	1,276	1,412	1,456
1915	86,873	17,851	6,033	119,317	7,261	10,473	19,205	3,974	12,116	5,441	16,540	2,788	4,264	884	1,458	12,951	1,034	683	1,331	2,092	5,413	7,786	1,012	1,446	2,029	1,723
1916	94,616	28,647	5,984	138,071	8,569	11,879	9,478	2,983	12,712	6,077	18,483	3,784	1,940	985	1,697	28,273	869	785	1,046	1,947	3,736	3,059	1,131	1,700	1,741	2,021
1917	119,961	24,242	5,709	88,420	6,014	11,933	8,867	1,836	13,406	5,287	14,599	3,687	2,543	975	1,603	16,062	982	835	1,109	2,415	2,141	5,955	1,111	1,493	1,579	1,691
1918	88,132	13,977	4,879	79,106	5,751	15,318	7,696	3,340	9,874	5,157	15,419	3,046	3,090	956	1,560	18,660	1,111	831	1,185	1,948	823	3,132	1,114	1,458	1,359	1,375
1919	99,347	12,026	5,422	123,708	5,961	14,191	6,680	2,933	10,136	4,896	24,482	3,490	3,985	1,038	2,389	30,134	1,110	811	1,124	1,732	1,018	4,824	1,034	1,488	1,812	1,224
1920	119,693	22,168	7,218	136,780	9,006	12,526	9,538	3,543	11,269	5,002	25,479	3,508	3,014	1,150	2,291	24,317	1,549	737	1,096	3,278	1,945	2,717	1,153	1,195	1,880	1,381
1921	100,392	17,670	6,084	107,249	5,803	13,273	8,178	3,001	9,625	3,683	26,285	4,080	2,861	1,569	2,055	31,529	1,262	718	1,342	2,816	2,149	4,208	1,566	1,111	1,674	1,395
1922	101,382	28,923	6,506	104,741	4,160	12,870	5,177	2,868	11,343	4,556	25,087	4,619	2,819	869	1,845	42,925	1,142	579	1,502	2,556	2,244	2,148	586	1,269	1,678	1,345
1923	126,554	56,981	6,426	102,296	4,892	15,865	5,342	2,719	8,118	4,776	19,692	4,312	4,893	914	1,998	35,341	1,117	544	1,708	2,645	2,065	3,356	520	1,640	2,228	1,696
1924	129,490	31,773	6,136	123,854	5,357	16,390	6,098	4,108	8,945	4,634	23,203	5,470	2,333	834	1,977	37,759	1,407	628	1,398	3,058	2,063	2,831	461	1,446	2,164	1,985
1925	145,866	58,709	6,096	125,517	5,917	17,310	5,859	3,902	10,833	5,069	22,362	4,571	3,659	864	1,854	52,647	1,375	646	1,278	3,487	4,912	3,368	456	1,679	2,318	2,251
1926	126,340	35,641	5,127	146,825	7,671	14,401	3,930	4,511	6,752	4,921	38,495	6,153	3,973	826	2,111	45,568	936	648	1,651	3,873	2,994	4,598	353	2,100	2,639	1,505
1927	153,980	34,100	5,562	174,214	8,147	16,929	3,597	2,946	6,423	4,529	23,630	5,367	3,330	828	2,196	196,705	970	634	1,675	2,823	2,971	3,426	314	1,804	2,440	1,537

[1] Average annual value of amounts caught 1921-1925 in millions of yen.
[2] Average amounts caught 1921-1925 in thousands of kwan.

TABLE 2. COASTAL FISHERY PRODUCTS—INDEX NUMBERS

	Sardines and Anchovy	Cuttle Fish	Sea Bream	Herrings	Yellow Tail	Mackerel	Bonito	Tunny	Flatfish	Prawns and Shrimps	Cod	Horse Mackerel	Oncorhynchus Keta	Eels	Grey Mullets	Laminaria	Cybium	Japanese Smelts	Sea Ears	Shark	Skipper	Oncorhynchus Masou	Carp	Gelidium	Flying Fish	Sea Cucumbers	Combined Geometric Average
Base[1]	120,737	38,811	6,250	112,731	5,226	15,142	6,131	3,319	9,773	4,531	23,326	4,610	3,313	1,010	1,946	40,040	1,261	623	1,446	2,912	2,687	3,182	718	1,429	2,024	1,735	
Weight[2]	30	23	22	17	11	10	10	8	7	7	5	5	5	5	4	4	3	3	3	2	2	2	2	2	1	1	
1894	47.31	22.90	87.81	2.87	73.04	43.60	149.26	114.88	35.72	107.97	8.63	44.58	34.20	23.56	.....	1.53	80.25	122.79	88.11	37.40	43.77	4.37	.....	84.53	16.06	44.09	37.87
1895	44.98	23.67	78.06	1.75	76.58	44.83	146.31	117.23	37.92	91.72	4.93	53.93	17.11	31.68	348.92	1.21	92.55	93.90	53.04	39.42	34.61	2.26	28.13	65.01	35.97	31.53	36.91
1896	40.20	29.69	84.43	1.74	73.02	42.99	147.94	145.89	22.78	75.92	3.12	41.54	18.62	35.94	80.47	0.86	88.10	124.40	67.15	38.15	54.86	4.43	17.97	62.00	20.26	32.39	32.56
1897	31.77	26.03	80.00	1.47	66.80	38.24	126.18	147.42	35.37	81.55	3.37	46.90	21.67	37.23	.....	2.27	78.91	131.30	52.84	45.36	14.96	3.05	17.13	49.34	20.60	29.11	31.71
1898	30.26	21.61	74.77	1.41	63.16	42.56	147.79	100.75	28.91	76.28	2.85	41.45	15.85	53.27	81.76	0.84	87.04	165.33	48.20	45.60	2.83	2.80	26.32	32.26	26.04	30.38	36.32
1899	40.16	22.39	69.57	0.74	72.16	36.88	158.03	87.07	34.28	101.26	6.29	52.84	29.16	68.91	.....	3.01	82.79	84.11	70.47	42.86	1.94	2.55	15.60	48.00	16.95	29.05	32.04
1900	40.25	22.83	89.06	0.33	104.04	49.62	179.27	118.29	31.07	92.70	4.60	49.24	20.07	101.39	80.94	0.84	98.73	94.06	58.30	40.59	5.10	2.90	17.83	62.14	62.25	38.27	32.57
1901	44.82	29.61	76.53	0.21	103.31	42.21	151.41	107.71	33.33	88.88	3.02	53.93	38.97	48.61	94.30	1.32	100.84	103.05	71.16	44.61	12.17	3.55	18.52	55.07	29.30	29.74	30.69
1902	51.53	31.68	71.46	0.23	68.10	39.27	150.06	71.20	30.09	90.00	3.24	69.28	20.74	40.20	73.90	0.97	86.20	62.62	57.88	42.72	21.55	3.49	19.36	91.67	29.94	37.75	27.71
1903	27.74	31.74	69.25	0.43	70.42	42.81	117.09	66.95	30.14	94.48	3.56	49.28	19.62	42.77	81.35	0.97	85.73	83.95	64.18	34.68	30.48	4.24	20.47	105.67	30.93	35.45	26.36
1904	32.85	28.53	69.41	0.23	69.84	41.71	137.29	59.26	33.21	76.58	6.78	64.66	12.86	47.82	80.27	1.64	71.21	83.47	54.01	40.66	58.58	3.61	32.45	48.64	35.28	37.23	28.10
1905	33.46	24.45	69.44	0.10	68.01	33.48	182.43	85.84	43.34	113.04	9.09	59.89	27.50	80.40	78.11	15.48	89.06	67.09	64.25	33.31	7.52	8.39	89.14	52.00	57.76	38.96	28.19
1906	31.63	28.96	75.82	1.58	89.93	29.88	190.23	82.07	56.80	102.89	7.53	58.37	35.62	67.23	68.24	19.11	86.99	76.73	69.43	33.45	33.72	10.21	64.48	58.78	77.82	36.95	36.15
1907	35.06	28.15	74.06	1.31	94.95	31.60	143.66	82.34	50.79	34.98	15.30	61.45	33.63	63.86	75.33	14.85	103.49	83.95	62.17	37.81	74.32	16.97	54.32	57.31	93.82	39.42	35.20
1908	35.30	24.38	79.20	2.11	114.93	31.94	217.93	89.67	51.91	89.87	23.12	63.01	25.29	60.89	73.33	12.29	91.90	95.02	56.15	33.55	62.37	21.02	63.23	55.28	226.88	52.97	39.21
1909	38.03	26.71	77.44	4.47	94.78	45.28	224.12	119.19	45.02	79.67	16.43	73.54	23.18	66.93	83.81	15.78	88.74	112.84	67.84	45.95	146.86	27.18	77.99	64.31	48.91	77.23	44.08
1910	41.16	33.33	83.68	45.87	89.74	50.52	180.04	110.67	67.46	95.43	64.88	70.00	80.38	71.88	89.26	17.80	89.53	121.19	99.17	53.23	138.48	103.61	100.00	81.46	76.09	63.05	63.21
1911	41.26	37.69	85.94	64.71	99.22	52.84	215.17	128.41	115.68	133.33	57.45	67.70	120.16	74.26	84.79	26.69	90.56	120.06	88.30	58.17	162.00	183.78	112.67	112.18	71.89	121.38	70.42
1912	55.52	56.51	86.00	59.23	114.37	59.61	216.90	96.57	144.65	135.18	74.01	68.61	95.77	72.87	76.41	32.70	108.64	123.60	75.45	100.89	593.67	166.09	111.56	93.00	87.25	64.73	80.89
1913	59.26	56.58	91.79	95.69	125.53	60.35	183.90	113.77	134.85	125.69	75.61	62.99	68.28	69.60	79.14	33.97	105.39	144.46	88.38	61.23	348.12	283.28	106.82	91.09	84.09	80.75	84.88
1914	69.99	67.16	82.66	96.03	117.28	65.08	233.86	131.79	105.19	82.86	72.50	61.67	60.91	69.60	74.72	28.89	86.84	127.93	80.77	51.96	192.92	73.92	120.47	89.29	69.76	83.92	86.21
1915	71.95	45.99	96.53	105.84	138.94	69.17	313.24	119.73	123.97	120.08	70.91	60.48	128.71	87.52	74.92	32.35	82.00	109.63	92.05	71.84	201.45	244.69	140.95	101.19	100.25	99.31	90.85
1916	78.37	73.81	95.74	122.48	163.97	78.45	154.59	89.88	130.07	134.12	79.24	82.08	58.56	97.52	87.20	70.61	68.91	126.00	72.34	66.86	139.04	96.13	157.52	118.96	86.02	116.48	95.63
1917	99.36	62.46	91.34	78.43	115.08	78.81	144.63	55.32	137.17	116.69	62.59	79.98	74.76	96.53	82.37	40.11	77.87	134.03	76.69	82.90	79.72	187.15	154.74	104.48	78.01	97.46	88.06
1918	73.00	36.02	78.06	70.17	110.05	101.16	125.53	100.63	101.03	113.82	66.10	60.07	93.27	94.65	80.16	46.60	88.10	133.39	81.95	66.90	30.63	98.43	155.16	102.03	67.14	79.25	76.43
1919	82.28	30.99	86.75	109.74	114.06	93.72	108.95	88.37	103.72	108.06	104.96	75.70	120.28	102.77	122.76	75.26	88.03	130.18	77.73	59.48	37.89	151.60	144.01	104.13	89.53	70.55	83.31
1920	99.14	57.12	115.49	121.33	172.33	82.72	155.57	106.75	115.31	110.40	109.23	76.10	90.97	113.86	117.73	60.73	122.84	118.30	78.50	112.57	72.39	85.39	160.58	83.62	92.89	79.60	100.92
1921	83.15	45.53	97.34	95.14	111.04	87.66	133.39	90.42	98.49	81.28	112.69	88.50	86.36	155.35	105.60	78.74	100.08	115.25	92.81	96.70	79.98	132.24	218.11	77.75	82.71	80.46	88.77
1922	83.97	74.52	104.10	92.91	79.60	85.00	84.44	86.41	116.06	100.55	107.55	100.20	85.09	86.04	94.81	107.21	90.56	92.43	103.87	87.77	83.51	67.50	81.62	88.80	82.91	77.52	89.13
1923	104.82	146.82	102.82	90.74	93.61	104.77	87.13	81.92	83.07	105.41	84.42	93.54	147.69	90.50	102.67	88.26	88.58	87.32	118.12	90.83	76.85	105.47	72.42	114.77	113.04	97.75	101.96
1924	107.25	81.87	98.18	109.87	102.51	108.24	99.46	123.77	91.53	102.27	99.47	118.66	70.42	82.57	101.59	94.30	111.58	100.80	96.68	105.01	76.78	88.97	64.21	101.19	106.93	150.78	99.01
1925	120.81	151.27	97.54	111.34	113.22	114.32	95.56	117.57	110.85	110.48	95.87	99.15	110.44	85.54	95.27	131.49	109.04	103.69	88.38	119.75	182.80	105.85	63.51	117.49	114.53	80.00	112.47
1926	104.64	91.83	82.03	130.24	146.54	93.65	64.10	135.91	69.07	108.61	165.03	133.47	119.92	81.78	108.48	113.81	74.23	104.01	114.18	133.00	111.43	144.50	49.16	146.96	130.39	86.74	102.29
1927	127.53	87.86	88.99	154.54	155.89	111.80	58.67	87.86	65.72	99.96	101.30	116.42	100.51	81.98	112.85	491.27	76.92	101.77	115.84	96.94	110.57	107.67	43.73	126.24	120.55	88.59	106.06

[1] Average annual amounts caught 1921-1925 in thousands of kwan.
[2] Average annual values of amounts caught 1921-1925 in millions of yen.

TABLE 3. CEREAL GROUP. QUANTITIES OF PRODUCTION IN THOUSANDS OF KWAN

Cereal Crop	Rice	Naked Barley	Wheat	Barley	Foxtail Millet	Buckwheat	Maize	Barnyard Millet	Proso Millet
Weight[1]	1,952	97	89	85	19	12	8	5	4
Base[2]	57,639	6,712	5,578	8,460	1,559	1,041	707	660	278
Year									
1894	41,859	7,316	3,972	8,533	2,145	1,192	....	999	250
1895	39,961	7,018	3,979	8,541	2,332	1,192	....	924	243
1896	36,240	5,927	3,559	7,853	2,548	1,090	....	912	246
1897	33,040	6,166	3,811	8,029	2,395	990	....	806	260
1898	47,388	7,367	4,182	8,914	2,627	1,193	....	901	292
1899	39,697	6,606	4,058	8,407	2,217	999	....	862	378
1900	41,566	7,344	4,256	8,667	2,487	1,285	....	865	384
1901	46,915	7,294	4,375	8,969	2,563	1,194	....	893	385
1902	36,932	6,325	3,954	8,146	2,003	949	....	567	287
1903	46,473	4,207	1,875	7,462	2,313	1,173	....	894	360
1904	51,430	6,856	3,859	8,927	1,981	1,176	....	927	374
1905	38,172	6,595	3,602	8,539	1,829	1,119	593	705	365
1906	46,303	6,958	3,962	9,445	2,313	1,203	611	775	364
1907	49,052	7,542	4,453	10,134	2,353	1,239	641	834	389
1908	51,934	7,579	4,412	9,444	2,280	1,234	637	814	335
1909	52,438	7,759	4,486	9,273	2,228	1,274	606	816	391
1910	46,633	6,718	4,602	9,291	2,093	1,312	723	775	423
1911	51,713	7,505	5,010	9,388	1,988	1,216	692	795	397
1912	50,222	7,900	5,180	9,791	1,860	997	743	708	382
1913	50,260	9,181	5,227	10,643	2,147	1,041	548	507	247
1914	57,008	7,207	4,488	9,549	1,747	1,369	770	959	461
1915	55,925	8,297	5,231	10,254	2,083	1,256	786	848	413
1916	58,452	7,920	5,887	9,532	2,184	1,172	765	822	451
1917	54,566	8,197	6,787	9,169	1,885	935	741	775	340
1918	54,703	7,777	6,431	8,368	1,837	852	649	757	309
1919	60,818	7,621	6,361	9,835	2,000	1,133	781	885	339
1920	63,209	8,297	5,891	8,290	1,889	1,208	771	840	337
1921	55,183	7,054	5,582	9,028	1,793	1,141	828	778	364
1922	60,694	7,132	5,727	8,772	1,656	1,100	675	741	291
1923	55,444	5,852	5,191	7,595	1,510	1,037	652	675	248
1924	57,170	5,740	5,268	8,076	1,411	895	690	463	238
1925	59,704	7,779	6,126	8,829	1,425	1,033	692	644	248
1926	55,593	7,441	5,897	8,569	1,241	817	575	588	167
1927	62,105	7,314	6,059	7,569	1,074	923	641	616	244

[1] Average annual value of average total production in the years 1921-5 in millions of yen.

[2] Average annual production in the years 1921-5 in thousands of koku.

TABLE 4. CEREAL GROUP. INDEX NUMBERS OF PRODUCTION

Cereal Crop	Rice	Naked Barley	Wheat	Barley	Foxtail Millets	Buckwheat	Maize	Barnyard Millets	Proso Millets	Combined Geometric Average
Base[1]	57,639	6,712	5,578	8,460	1,559	1,041	707	660	278	
Weight[2]	1,952	97	89	85	19	12	8	5	4	
1894	72.62	108.99	71.20	100.86	.....	115.47	.....	151.36	89.93	75.26
1895	69.33	104.56	71.32	100.99	.....	114.51	.....	140.00	87.41	72.74
1896	62.87	88.30	63.79	92.83	.....	104.71	.....	138.18	88.49	65.38
1897	57.32	91.78	68.31	94.91	.....	95.10	.....	122.12	93.53	61.58
1898	82.22	109.76	74.96	105.37	168.51	114.60	.....	136.52	105.04	84.71
1899	68.87	98.42	72.74	99.37	142.21	95.97	.....	130.45	135.97	71.96
1900	71.94	110.74	76.29	102.45	159.53	123.44	.....	131.06	138.13	75.49
1901	81.39	108.67	78.42	106.25	164.40	114.70	.....	135.30	138.49	84.10
1902	64.07	94.23	70.87	96.20	128.48	91.16	.....	85.91	103.24	79.75
1903	80.63	62.68	33.61	88.20	148.36	112.68	.....	135.45	129.50	78.18
1904	89.23	102.15	69.17	105.53	127.07	112.97	.....	140.45	134.53	90.13
1905	66.23	98.26	64.56	100.93	117.32	107.49	83.88	106.82	131.29	69.43
1906	80.33	103.67	71.02	111.64	148.36	115.56	86.42	117.42	130.94	82.74
1907	85.10	112.37	79.82	119.79	150.93	119.02	90.66	126.36	139.93	87.92
1908	90.10	112.92	79.08	111.63	146.25	118.54	90.10	123.33	120.50	92.02
1909	90.98	115.60	80.41	109.61	142.91	122.38	85.71	123.64	140.61	92.91
1910	80.91	100.09	82.49	109.82	134.25	126.03	102.26	117.42	152.16	83.62
1911	89.72	111.81	89.80	110.97	127.52	116.81	97.88	120.45	142.81	92.06
1912	87.13	117.70	92.85	115.73	119.31	95.77	105.09	107.27	137.41	90.07
1913	87.20	136.78	93.60	125.80	137.72	100.00	77.51	76.82	88.85	90.90
1914	98.91	107.37	80.44	112.87	112.06	131.51	108.91	145.30	165.83	99.61
1915	97.03	123.61	93.76	121.21	133.61	121.65	111.17	128.48	148.56	98.51
1916	101.41	118.00	105.52	112.69	140.09	112.58	108.20	124.55	162.23	103.64
1917	94.67	122.12	121.65	108.38	120.91	89.82	104.81	117.42	122.30	97.64
1918	94.91	115.87	115.27	98.91	117.83	81.84	91.80	114.70	111.15	96.95
1919	105.52	113.54	114.02	116.25	128.29	108.84	110.47	134.09	121.94	107.97
1920	109.66	123.61	105.59	97.99	121.17	116.04	109.05	127.27	121.22	110.00
1921	95.74	105.10	100.05	106.71	115.01	109.61	117.11	117.88	130.94	97.06
1922	105.30	106.26	102.65	103.69	106.22	105.67	95.47	112.27	104.68	105.16
1923	96.19	87.25	93.05	89.78	96.86	99.62	92.22	102.27	89.21	95.43
1924	99.19	85.52	94.43	95 46	90.51	85.98	97.60	70.15	85.61	97.98
1925	103.58	115.90	109.80	104.34	91.40	99.23	97.88	97.58	89.21	104.15
1926	96.45	110.86	105.72	100.29	79.61	78.48	81.33	89.09	60.07	97.10
1927	107.75	108.96	108.62	89.47	68.89	88.66	91.51	87.13	87.77	106.43

[1] Average annual production 1921-1925 in thousands of koku.

[2] Average annual total value of production 1921-1925 in millions of yen.

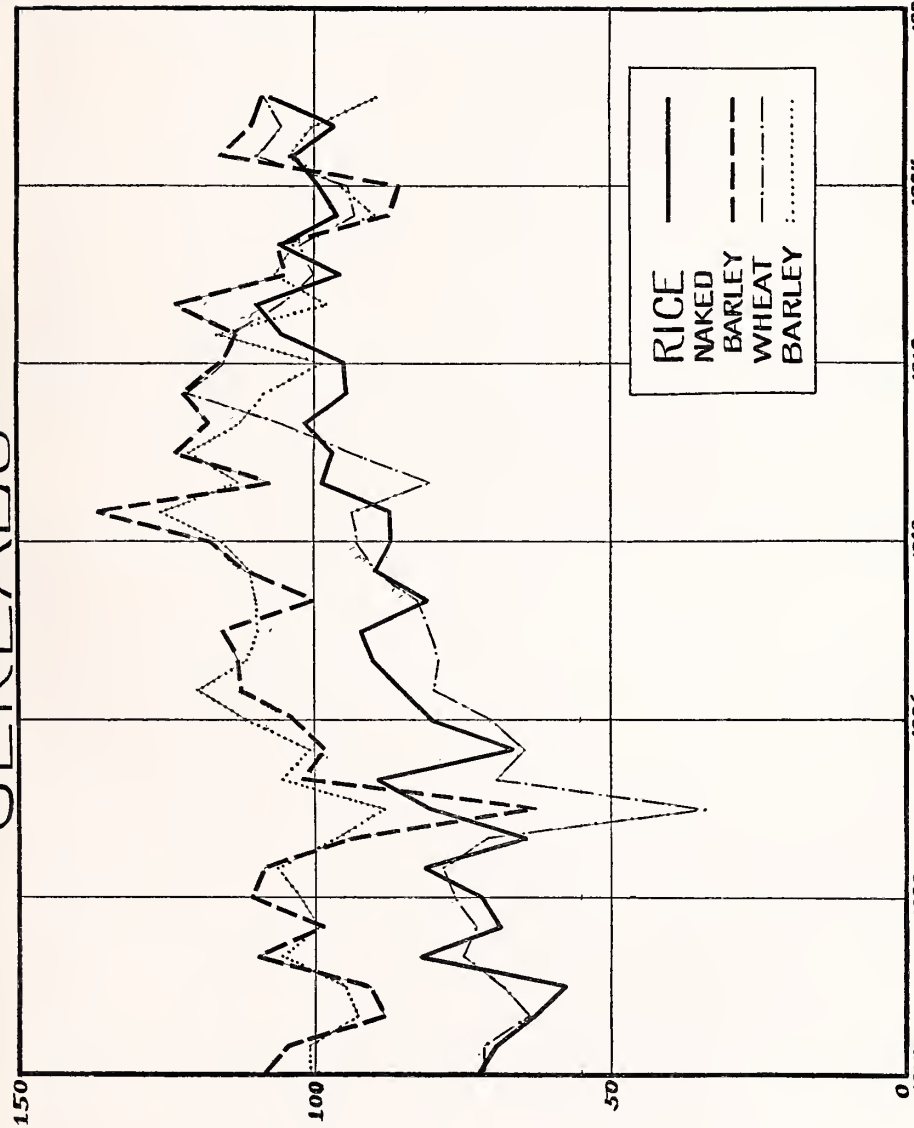


DIAGRAM A. GRAPH SHOWING PRODUCTION OF CEREALS

TABLE 5. POTATOES—QUANTITIES OF PRODUCTION

	Sweet Potatoes	Irish Potatoes		Sweet Potatoes	Irish Potatoes
Weight[1]	110	32	Weight[1]	110	32
Base[2]	1,005,326	250,449	Base[2]	1,005,326	250,449
1894	495,949	49,753	1911	1,005,903	182,660
1895	711,813	44,274	1912	980,502	186,292
1896	725,942	44,221	1913	1,037,209	189,700
1897	662,392	58,528	1914	981,108	234,503
1898	716,956	34,089	1915	1,055,634	254,759
1899	661,445	64,595	1916	1,092,027	280,232
1900	756,936	71,775	1917	1,000,357	345,576
1901	711,640	73,683	1918	1,098,520	323,930
1902	712,126	53,833	1919	1,190,758	487,964
1903	751,178	71,296	1920	1,183,326	288,384
1904	660,495	81,820	1921	1,050,679	286,714
1905	651,678	117,970	1922	1,005,057	244,101
1906	798,664	135,650	1923	1,019,397	228,388
1907	926,196	147,398	1924	956,038	233,351
1908	963,738	153,672	1925	995,460	259,690
1909	907,487	159,638	1926	885,948	288,694
1910	832,878	179,398	1927	879,000	250,121

[1] Average annual values of production 1921-1925 in millions of yen.
[2] Average annual production 1921-1925 in thousands of kwan.

TABLE 6. POTATOES—INDEX NUMBERS OF PRODUCTION

	Sweet Potatoes	Irish Potatoes	Combined Index		Sweet Potatoes	Irish Potatoes	Combined Index
Base[1]	1,005,326	250,449		Base[1]	1,005,326	250,449	
Weight[2]	110	32		Weight[2]	110	32	
1894	49.33	19.87	40.19	1911	100.06	72.93	98.76
1895	70.80	17.68	51.79	1912	97.53	74.38	91.75
1896	72.21	17.66	52.57	1913	103.17	75.74	96.23
1897	65.89	23.37	52.16	1914	97.58	93.63	96.68
1898	71.31	13.61	49.10	1915	105.00	101.74	104.26
1899	66.79	25.79	53.90	1916	108.62	111.89	109.35
1900	75.29	28.66	60.56	1917	99.51	137.98	107.12
1901	71.78	29.42	58.71	1918	109.27	129.34	113.50
1902	70.83	21.49	54.08	1919	118.45	194.80	132.50
1903	74.72	28.47	60.12	1920	117.71	115.12	117.12
1904	65.70	32.67	56.13	1921	104.52	114.46	106.68
1905	64.83	47.10	60.33	1922	99.98	97.45	99.40
1906	79.45	54.16	72.88	1923	101.40	91.17	99.00
1907	92.13	58.85	83.28	1924	95.20	93.15	94.66
1908	95.86	61.36	86.69	1925	99.03	103.67	100.05
1909	90.27	63.74	83.46	1926	88.12	91.31	88.93
1910	82.85	71.63	80.17	1927	87.44	99.87	90.10

[1] Average annual production 1921-1925 in thousands of kwan.
[2] Average annual values of production 1921-1925 in millions of yen.

TABLE 7

BEANS—QUANTITIES OF PRODUCTION

	Soy Bean	Azuki		Soy Bean	Azuki
Weight[1]	62	21	Weight[1]	62	21
Base[2]	3,637	998	Base[2]	3,637	998
1894	2,943	560	1911	3,693	956
1895	3,164	616	1912	3,511	947
1896	2,999	579	1913	2,993	601
1897	3,101	619	1914	3,665	913
1898	3,109	655	1915	3,808	962
1899	3,411	823	1916	3,750	887
1900	3,562	856	1917	3,605	871
1901	4,070	925	1918	3,451	811
1902	3,137	709	1919	3,931	878
1903	3,648	918	1920	4,270	1,068
1904	3,710	730	1921	4,261	1,231
1905	3,262	804	1922	3,638	951
1906	3,517	897	1923	3,434	889
1907	3,667	926	1924	3,242	900
1908	3,893	875	1925	3,608	1,061
1909	3,767	903	1926	2,999	676
1910	3,397	966	1927	3,263	877

[1] Average annual values of production 1921-1925 in millions of yen.
[2] Average annual production 1921-1925 in thousands of koku.

TABLE 8

BEANS—INDEX NUMBERS OF PRODUCTION

	Soy Bean	Azuki	Combined Index		Soy Bean	Azuki	Combined Index
Base	3,637	998		Base	3,637	998	
Weight	62	21		Weight	62	21	
1894	80.92	55.67	73.61	1911	101.54	95.03	99.85
1895	86.99	61.23	79.59	1912	96.54	94.14	95.93
1896	82.46	57.55	75.29	1913	82.29	59.74	75.89
1897	85.26	61.53	78.51	1914	100.77	90.76	98.14
1898	85.48	65.11	79.79	1915	104.70	95.63	101.48
1899	93.79	81.81	90.60	1916	103.11	88.17	99.11
1900	97.94	86.08	94.79	1917	99.12	86.58	95.79
1901	111.91	91.95	106.48	1918	94.89	80.62	91.06
1902	86.25	70.48	81.95	1919	108.08	87.28	102.39
1903	100.30	91.25	97.93	1920	117.40	106.16	114.45
1904	102.01	72.56	93.58	1921	117.16	122.36	118.46
1905	89.94	79.92	87.29	1922	100.03	94.53	98.61
1906	96.70	89.17	94.74	1923	94.42	88.37	92.85
1907	100.82	92.04	98.52	1924	89.14	89.46	89.22
1908	107.04	86.98	101.57	1925	99.20	105.46	100.75
1909	103.57	89.76	99.89	1926	82.46	67.74	78.28
1910	93.40	96.04	94.06	1927	89.72	87.88	89.25

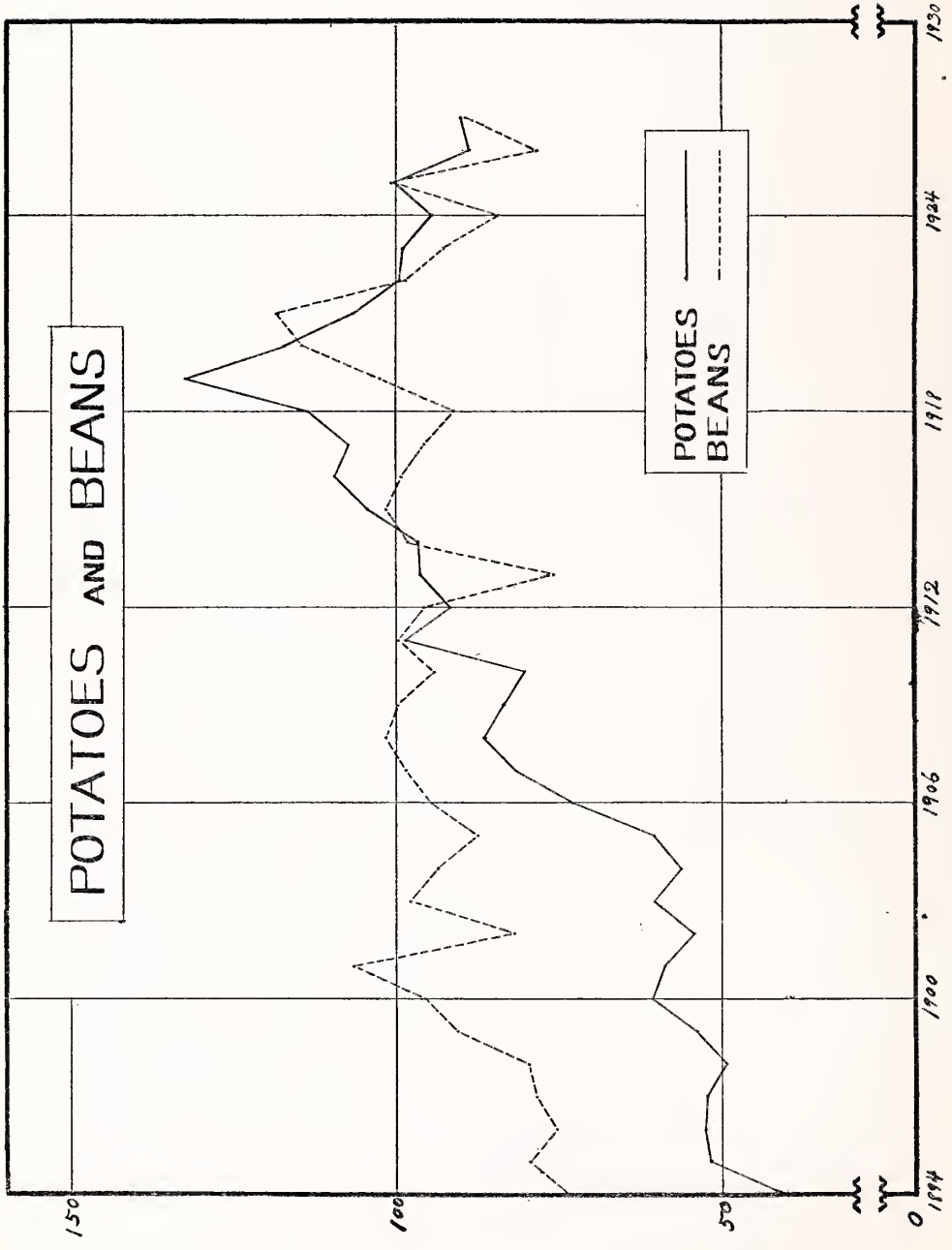


DIAGRAM B. GRAPH SHOWING PRODUCTION OF POTATOES AND BEANS

TABLE 9
FOOD INDEX I. 1894-1927

	Cereals	Fish	Potatoes	Beans	Tea	Combined Food Index
Weights	2271	337	142	83	34	
Year						
1894	75.26	37.87	40.19	73.61	82.67	67.33
1895	72.74	36.91	51.79	79.59	90.18	66.38
1896	65.38	32.56	52.57	75.29	89.15	60.05
1897	61.58	31.71	52.16	78.51	88.85	57.14
1898	84.71	36.32	49.10	79.79	88.54	74.55
1899	71.96	32.04	53.90	90.60	78.86	65.00
1900	75.49	32.57	60.56	94.79	79.83	68.14
1901	84.10	30.69	58.71	106.48	71.84	73.75
1902	79.75	27.71	54.08	81.95	71.14	69.05
1903	78.18	26.36	60.12	97.93	70.38	68.27
1904	90.13	28.10	56.13	93.58	73.81	76.67
1905	69.43	28.19	60.33	87.29	71.00	62.45
1906	82.74	36.15	72.88	94.74	73.91	74.79
1907	87.92	35.20	83.28	98.52	76.70	78.87
1908	92.02	39.21	86.69	101.57	77.69	83.07
1909	92.91	44.08	83.46	99.89	83.80	84.74
1910	83.62	63.21	80.17	94.06	87.49	81.07
1911	92.06	70.42	98.76	99.85	91.04	89.46
1912	90.07	80.89	91.75	95.93	94.21	89.23
1913	90.90	84.88	96.23	75.89	92.08	89.97
1914	99.61	86.21	96.68	98.14	90.91	97.64
1915	98.51	90.85	104.26	101.48	95.98	97.91
1916	103.64	95.63	109.35	99.11	106.80	102.84
1917	97.64	88.06	107.12	95.79	110.50	97.00
1918	96.95	76.43	113.50	91.06	112.81	95.01
1919	107.97	83.31	132.50	102.39	109.05	105.65
1920	110.00	100.92	117.12	114.45	101.16	109.25
1921	97.06	88.77	106.68	118.46	94.16	97.02
1922	105.16	89.13	99.40	98.61	98.16	102.57
1923	95.43	101.96	99.00	92.85	100.44	96.33
1924	97.98	99.01	94.66	89.22	100.05	97.69
1925	104.15	112.47	100.05	100.75	107.17	104.82
1926	97.18	102.29	88.93	78.28	101.31	96.78
1927	106.43	106.06	90.10	89.25	103.39	104.94

TABLE 10

INDEX NUMBERS OF POPULATION, FOOD PRODUCTION AND CEREAL PRODUCTION

	Food	Population	Cereals		Food	Population	Cereals
1894	100.00	100.00	100.00[1]	1911	132.87	123.77	122.32
1895	98.59	101.10	96.65	1912	132.53	125.61	119.68
1896	89.19	102.14	86.87	1913	133.63	127.38	120.78
1897	84.87	103.39	81.82	1914	145.02	129.49	132.34
1898	110.72	104.67	112.56	1915	145.42	131.38	130.89
1899	96.54	105.88	95.62	1916	152.74	133.06	137.71
1900	101.20	107.20	100.31	1917	144.07	134.73	129.74
1901	109.54	108.69	111.75	1918	141.11	135.53	128.82
1902	102.55	110.11	105.97	1919	156.91	136.88	143.46
1903	101.40	111.77	103.88	1920	162.26	138.52	146.16
1904	113.87	112.93	119.76	1921	144.10	140.38	128.97
1905	92.75	114.03	92.25	1922	152.34	142.20	139.73
1906	111.08	115.19	109.94	1923	143.07	144.11	126.80
1907	117.14	116.76	116.82	1924	143.61	146.08	130.19
1908	123.38	118.60	122.27	1925	155.68	148.39	138.39
1909	125.86	120.19	123.45	1926	143.74	150.69	129.13
1910	120.41	121.94	111.11	1927	155.86	152.73	141.42

[1] Base year 1894.

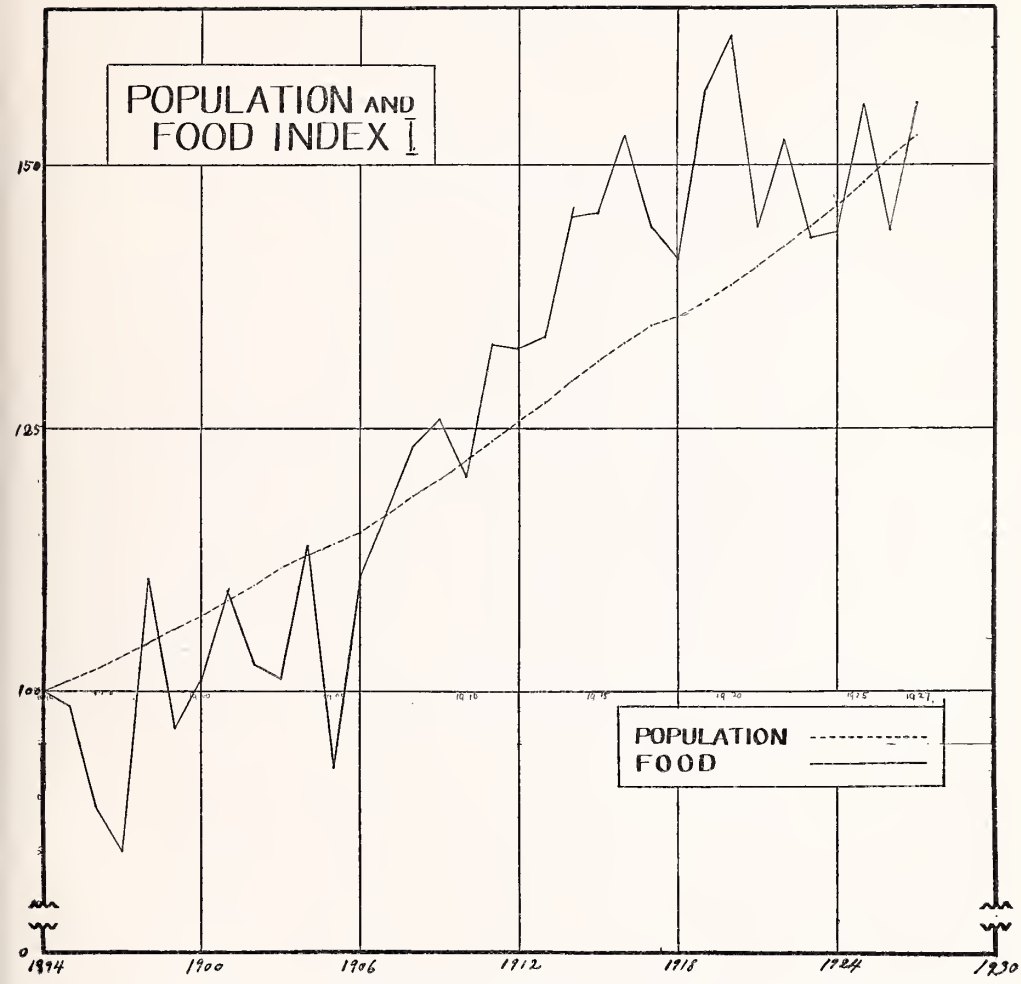


DIAGRAM C. GRAPH SHOWING GROWTH OF POPULATION AND FOOD PRODUCTION

TABLE 11

ANIMAL FOODSTUFFS OTHER THAN FISH
QUANTITIES OF PRODUCTION

	Meat	Eggs	Milk		Meat	Eggs	Milk
Weight[1]	86	68	23	Weight[1]	86	68	23
Base[2]	24,201[3]	1,479,712[4]	432,683[5]	Base[2]	24,201[3]	1,479,712[4]	432,683[5]
1906	10,235	593,660	173,540	1917	19,538	1,151,401	338,664
1907	11,150	699,460	201,608	1918	17,957	1,153,972	336,195
1908	10,561	753,617	209,440	1919	18,379	1,161,428	335,115
1909	10,933	766,491	235,606	1920	19,873	1,134,367	352,494
1910	14,544	803,928	255,562	1921	23,536	1,240,486	454,626
1911	15,936	820,500	267,874	1922	22,181	1,370,993	409,251
1912	16,264	809,846	274,480	1923	22,412	1,551,516	408,780
1913	16,267	801,708	273,936	1924	25,298	1,615,849	425,106
1914	15,089	782,768	282,874	1925	27,578	1,619,716	465,651
1915	17,641	862,081	299,180	1926	24,507	1,731,089	513,810
1916	20,493	1,002,072	308,091	1927	22,511	1,981,587	501,677

[1] Average annual values 1921-1925 in millions of yen.

[2] Average annual production 1921-1925.

[3] Thousands of kwan.

[4] Numbers of eggs in thousands.

[5] Thousands of koku.

TABLE 12
ANIMAL FOODSTUFFS
INDEX NUMBERS OF PRODUCTION

	Fish	Meat	Eggs	Milk	All Animal Food-stuffs
Weight	337	86	68	23	
1905	28.19	44.84	.....	37.27	31.28
1906	36.15	42.29	40.12	40.11	37.80
1907	35.20	46.07	47.27	46.60	38.77
1908	39.21	43.64	50.93	48.40	41.72
1909	44.08	45.18	51.80	54.45	45.65
1910	63.21	60.10	54.33	59.06	61.25
1911	70.42	65.85	55.45	61.91	67.08
1912	80.89	67.20	54.73	63.44	73.66
1913	84.88	67.22	54.18	63.31	75.92
1914	86.21	62.35	52.90	65.38	75.61
1915	90.85	72.89	58.26	69.15	81.56
1916	95.63	84.68	67.72	76.51	88.63
1917	88.06	80.73	77.81	78.27	84.93
1918	76.43	74.20	77.99	77.70	76.31
1919	83.31	75.94	78.49	77.45	81.12
1920	100.92	82.12	76.68	81.47	88.45
1921	88.77	97.25	83.83	105.07	90.13
1922	89.13	91.65	92.65	94.58	90.25
1923	101.96	92.61	104.85	94.48	100.36
1924	99.01	104.53	109.20	98.25	101.18
1925	112.47	113.95	109.46	107.62	112.09
1926	102.29	101.26	116.99	118.75	104.64
1927	106.06	93.02	133.92	115.95	105.16

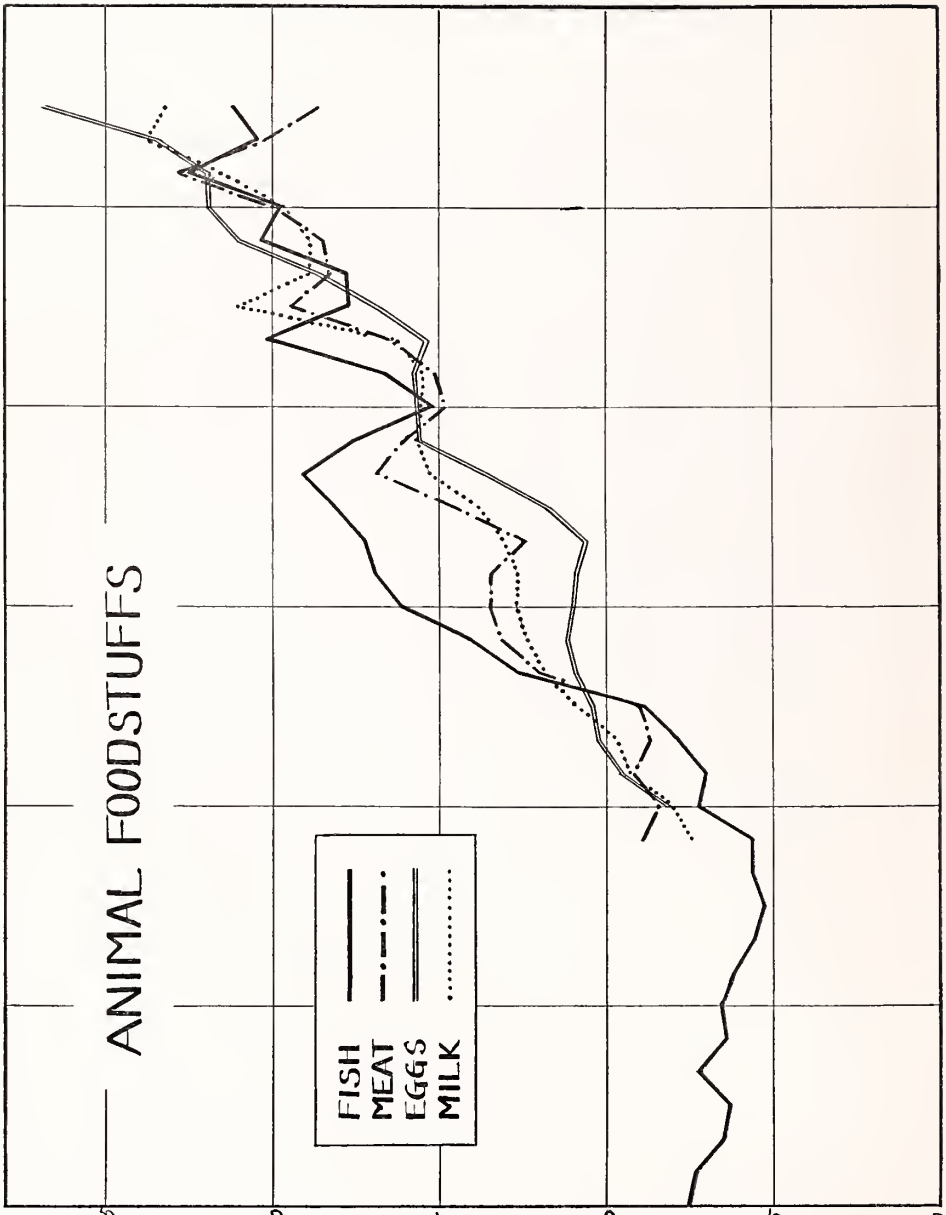


DIAGRAM D. GRAPH SHOWING PRODUCTION OF ANIMAL FOODSTUFFS

TABLE 13

FRUIT GROUP—QUANTITIES OF PRODUCTION

Fruit	Mandarins	Persimmons	Pears	Ume[1]	Apples	Peaches	Grapes	Bitter Oranges	Navel Oranges	Loquats
Wght.[2]	18	15	13	7	6	5	5	3	2	2
Base[3]	54,154	49,194	29,150	374	11,711	10,995	7,595	12,949	3,323	2,974
Year										
1905	23,228	43,315	15,211	471	6,071	5,413	1,784	....	....	....
1906	26,012	46,261	13,884	606	5,669	6,537	1,892	....	....	....
1907	24,533	51,694	14,349	517	6,703	7,072	2,546	....	....	....
1908	31,205	54,084	14,759	484	5,187	9,515	2,718	....	....	....
1909	27,698	43,976	16,909	470	6,308	9,848	3,136	9,920	651	1,875
1910	36,692	46,358	19,060	478	12,743	9,169	3,322	11,274	902	2,523
1911	37,442	43,374	18,296	473	10,790	9,414	3,456	11,760	1,286	2,535
1912	46,410	40,044	19,955	519	8,382	10,962	3,679	13,239	1,945	2,610
1913	45,524	47,041	20,781	472	9,504	10,796	3,799	11,431	2,184	2,558
1914	39,932	38,911	20,215	436	9,537	10,463	3,955	12,830	2,076	2,536
1915	41,781	47,914	21,529	413	7,065	12,116	4,529	11,228	2,304	2,475
1916	57,910	40,039	23,879	342	9,296	12,964	4,985	17,224	2,953	2,607
1917	26,971	45,286	28,739	332	10,087	13,400	5,194	11,929	2,495	2,381
1918	40,922	30,226	27,190	383	6,695	12,408	5,669	11,211	2,649	2,516
1919	50,147	43,618	27,107	412	5,989	12,809	6,246	13,953	3,201	2,597
1920	53,625	45,529	26,973	401	7,711	13,168	6,756	13,732	3,457	2,546
1921	3,910	49,615	29,378	406	7,258	11,065	6,294	12,369	1,045	2,751
1922	51,056	46,555	29,759	348	17,279	10,558	6,848	15,474	3,269	2,933
1923	57,077	44,275	26,884	378	8,001	11,236	7,384	9,187	3,447	3,060
1924	53,599	62,628	27,537	328	10,628	10,172	7,981	12,681	3,175	2,948
1925	53,414	42,899	33,190	411	15,387	11,943	9,466	15,034	3,268	3,181
1926	73,001	70,897	35,175	398	26,017	12,008	10,856	16,852	3,859	3,072
1927	57,895	58,094	38,570	428	19,071	13,750	10,980	13,016	3,786	3,626

[1] Production figures in thousands of koku, not kwan.

[2] Average value of total production in each year 1921-5, in millions of yen.

[3] Average production in each year 1921-5, in thousands of kwan.

TABLE 14

FRUIT GROUP—INDEX NUMBERS OF PRODUCTION

Fruit	Mandarins	Persimmons	Pears	Ume[1]	Apples	Peaches	Grapes	Bitter Oranges	Navel Oranges	Loquats	Combined Index
Wght.[2]	18	15	13	7	6	5	5	3	2	2	
Base[3]	54,154	49,194	29,150	374	11,711	10,995	7,595	12,949	3,323	2,974	
Year											
1905	42.89	88.05	52.18	125.94	51.84	49.23	23.49	....	....	....	58.75
1906	48.03	94.04	47.63	162.03	48.41	59.45	24.91	....	....	....	60.84
1907	63.77	105.08	49.22	138.24	57.24	64.32	33.52	....	....	....	69.28
1908	57.62	109.94	50.63	129.41	44.29	86.54	35.79	....	....	....	68.31
1909	51.15	89.39	58.01	125.67	53.86	89.57	41.29	76.71	19.59	63.03	64.79
1910	67.75	94.24	65.39	127.81	108.81	83.39	43.74	87.06	27.14	84.81	77.27
1911	69.14	88.17	62.77	126.47	92.14	85.62	45.10	90.82	38.70	85.21	76.16
1912	85.70	81.40	68.46	138.77	71.57	99.70	48.44	102.24	58.53	87.73	81.65
1913	84.06	95.62	71.29	126.20	81.15	98.19	50.02	88.28	65.72	85.98	84.40
1914	73.74	79.10	69.35	116.58	81.43	95.16	52.07	99.08	62.47	85.24	87.87
1915	77.15	97.40	73.85	110.43	60.33	110.20	59.63	86.71	69.33	83.19	82.12
1916	106.94	81.39	81.92	91.44	79.38	117.91	65.64	94.40	88.87	87.63	89.49
1917	49.84	92.06	98.59	88.77	86.13	121.87	68.39	92.12	75.08	80.03	79.05
1918	75.57	61.44	93.28	102.41	57.16	112.85	74.64	86.58	79.72	84.57	78.40
1919	92.60	88.67	92.99	110.16	51.14	116.50	82.24	107.75	96.33	87.29	90.28
1920	102.72	92.55	92.53	107.22	65.84	119.76	88.95	106.05	104.03	85.58	94.41
1921	7.39	100.86	100.78	108.56	61.98	100.64	82.87	95.52	31.57	92.47	50.14
1922	94.27	94.64	98.66	93.45	147.55	96.03	90.16	119.50	98.37	98.59	99.41
1923	105.40	90.00	92.23	101.07	68.32	103.19	97.22	70.95	103.73	102.86	93.84
1924	98.98	127.31	94.47	87.70	90.75	92.51	105.08	97.63	95.55	99.09	101.17
1925	98.63	87.20	113.86	109.89	131.39	108.62	124.63	116.09	98.34	106.92	105.05
1926	134.80	144.19	120.67	106.42	222.16	109.21	142.94	130.14	116.13	103.30	133.42
1927	106.91	118.09	132.32	114.44	162.85	125.06	144.57	100.52	113.93	121.92	121.51

[1] Thousands of koku, not kwan.

[2] Average value of total production in each year 1921-5 in millions of yen.

[3] Average production in each year 1921-5 in thousands of kwan.

TABLE 15. FOOD INDEX II. 1905–1927

	Cereals	Animal Food-stuffs	Potatoes	Beans	Fruit	Tea	Combined Food Index
Weights	2271	514	142	83	77	34	
Year							
1905	64.43	31.28	60.26	87.29	58.75	71.00	60.63
1906	82.74	37.80	72.84	94.74	60.84	73.91	71.93
1907	87.92	38.77	83.29	98.52	69.28	76.70	76.31
1908	92.02	41.72	86.67	101.57	68.31	77.69	80.03
1909	92.91	45.65	83.44	99.89	64.79	83.80	81.58
1910	83.62	61.25	80.14	94.06	77.27	87.49	79.42
1911	92.06	67.08	93.14	99.85	76.16	91.04	87.20
1912	90.07	73.66	91.74	95.93	81.65	94.21	87.19
1913	90.90	75.92	96.24	75.89	84.40	92.08	87.90
1914	99.61	75.61	96.70	98.14	87.87	90.91	94.63
1915	98.51	81.56	103.54	101.48	82.12	95.98	95.36
1916	103.64	88.63	109.38	99.11	89.49	106.80	100.80
1917	97.64	84.93	99.57	95.79	79.05	110.50	95.41
1918	96.95	76.31	113.49	91.06	78.40	112.81	93.38
1919	107.97	81.12	132.49	102.39	90.28	109.05	103.37
1920	110.00	88.45	117.13	114.45	94.41	101.16	106.04
1921	97.06	90.13	106.51	118.46	50.14	94.16	95.21
1922	105.16	90.25	99.48	98.61	99.41	98.16	101.89
1923	95.43	100.36	99.00	92.85	93.84	100.44	96.33
1924	97.98	101.18	94.76	89.22	101.17	100.05	98.20
1925	104.15	112.09	100.05	100.75	105.05	107.17	105.19
1926	97.18	104.64	88.93	78.28	133.42	101.31	98.22
1927	106.43	105.16	90.10	89.25	121.51	103.39	105.24

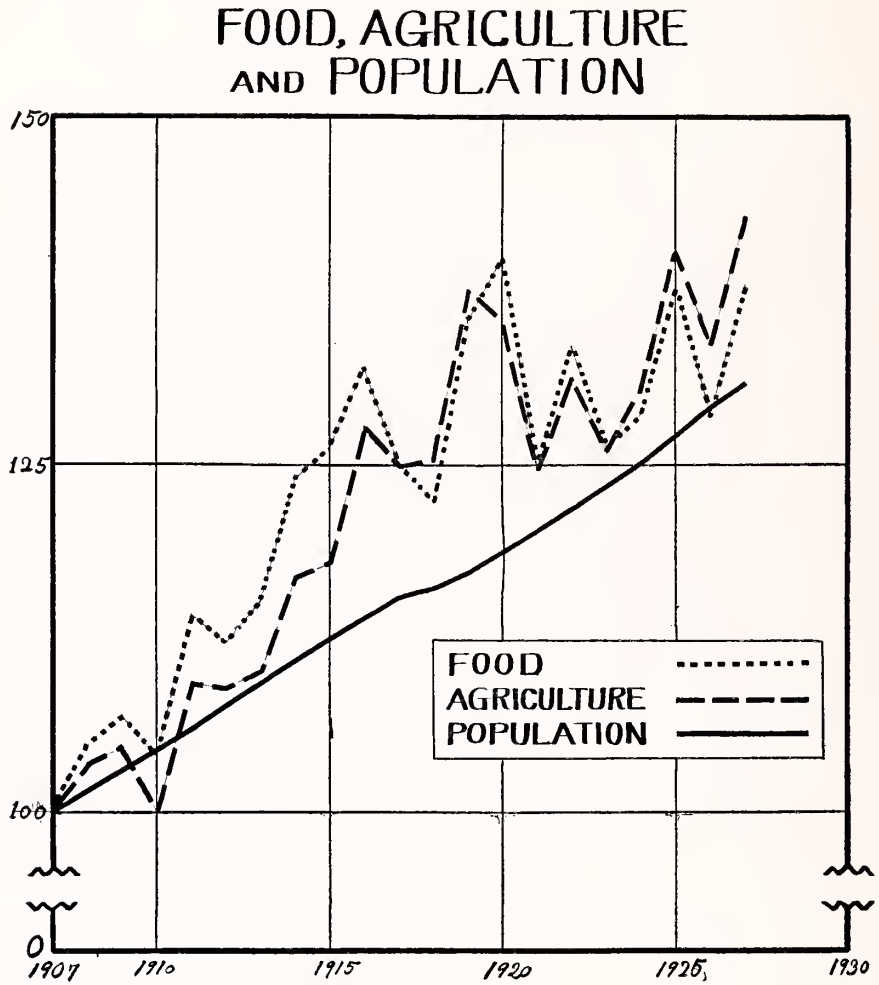


DIAGRAM E. GRAPH SHOWING GROWTH OF POPULATION, FOOD AND AGRICULTURAL PRODUCTION

TABLE 16. VEGETABLE GROUP. QUANTITIES OF PRODUCTION IN THOUSANDS OF KWAN

Vegetable	Daikon	Sato Imo	Egg Plant	Tsukena	Edible Burdocks	Water Melons	Pumpkins	Welsh Onions	Cucumbers	Renkon	Horse[1] Beans	Pease	Carrots	Cabbage	Turnips	Musk Melons	Onions	Peanuts
Weight[2]	61	36	22	18	16	15	14	12	12	11	8	7	7	5	5	4	3	3
Base[3]	642,589	159,328	104,227	133,338	48,978	49,950	76,407	47,064	54,966	11,129	480	361[1]	28,885	26,396	39,942	12,713	16,862	283
Year																		
1909	657,068	.....	75,421	85,247	42,677	16,415	48,791	28,271	40,331	.....	473	272	28,064	8,804	39,924	9,386	3,640	265
1910	657,490	150,023	80,537	106,748	43,781	19,845	56,748	27,593	46,331	4,686	460	288	28,785	11,446	42,613	10,915	4,963	251
1911	684,108	163,957	84,981	109,901	44,806	20,939	65,179	33,240	47,196	5,250	487	306	31,101	12,520	45,443	11,257	5,615	306
1912	678,575	161,364	88,369	121,267	42,901	23,233	68,816	32,241	45,151	6,441	502	374	28,261	13,085	47,256	10,525	5,466	391
1913	728,847	151,606	87,734	126,422	43,930	20,549	63,423	37,801	60,094	6,675	490	378	29,161	14,831	46,356	9,115	5,863	431
1914	722,114	149,105	90,645	131,198	43,751	21,240	78,785	38,621	49,064	6,579	487	424	29,717	17,417	47,187	10,836	6,753	432
1915	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	510	415	.....	.....	.....	.....	6,837	403
1916	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	537	455	.....	.....	.....	.....	7,709	479
1917	576,746	159,168	98,840	114,488	43,424	37,817	78,711	37,601	53,453	8,279	518	761	26,976	19,951	41,527	14,102	7,400	456
1918	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	426	535	.....	.....	.....	.....	8,247	556
1919	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	502	594	.....	.....	.....	.....	9,303	446
1920	696,406	170,955	102,757	146,252	48,378	31,818	85,231	47,523	54,777	8,353	527	304	31,918	26,103	43,846	13,053	10,289	402
1921	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	474	283	.....	.....	.....	.....	11,922	340
1922	649,331	156,167	110,087	127,892	48,881	50,010	74,094	42,386	55,387	11,381	454	370	28,503	25,692	39,864	12,621	15,749	275
1923	631,062	161,230	100,167	127,400	50,101	44,084	73,917	48,078	54,688	11,933	508	440	28,735	27,431	39,402	12,172	20,300	282
1924	607,586	149,190	101,905	128,812	48,031	56,338	73,889	46,832	54,102	12,038	478	373	26,693	25,176	38,551	12,660	16,231	279
1925	628,561	159,217	106,218	136,336	49,499	67,501	74,906	50,503	55,876	11,943	486	338	28,575	27,583	38,047	13,059	20,089	237
1926	638,549	154,965	104,157	144,035	49,118	61,743	66,771	52,684	56,071	14,197	490	381	28,665	27,077	39,960	12,598	22,599	212
1927	684,140	163,120	109,067	163,222	50,279	70,570	71,779	55,033	59,495	12,624	484	450	29,717	31,632	41,587	13,253	23,389	187

[1] Thousands of koku, not kwan.

[2] Average value of total production in each year 1920 and 1922-25 in millions of yen.

[3] Average production in each year 1920 and 1922-25 in thousands of kwan.

TABLE 17. VEGETABLE GROUP. INDEX NUMBERS OF PRODUCTION

Vegetable	Daikon	Sato Imo	Egg Plant	Tsukena	Edible Burdocks	Water Melons	Pumpkins	Welsh Onions	Cucumbers	Renkon	Horse[1] Beans	Pease	Carrots	Cabbage	Turnips	Musk Melons	Onions	Peanuts
Base[2]	642,589	159,328	104,227	133,338	48,978	49,950	76,407	47,064	54,966	11,129	480	361	28,885	26,396	39,942	12,713	16,862	283
Weight[3]	61	36	22	18	16	15	14	12	12	11	8	7	7	5	5	4	3	3
Year																		
1909	102.25	.....	72.36	63.93	87.14	32.86	63.86	60.07	73.37	....	98.54	75.35	97.16	33.35	99.95	73.83	21.59	93.64
1910	102.32	94.16	77.27	80.06	89.39	39.73	74.27	58.63	84.29	42.41	95.83	79.78	99.65	43.36	106.69	85.86	29.43	88.69
1911	106.46	102.95	81.53	82.42	91.48	41.92	85.31	70.63	85.86	47.17	101.46	84.49	107.67	47.43	113.77	88.55	33.30	108.13
1912	105.60	101.32	84.79	90.95	87.59	46.51	90.07	68.50	82.14	57.88	104.58	103.60	97.84	49.57	118.31	82.79	32.42	138.16
1913	113.42	95.17	84.18	94.81	89.69	41.14	83.66	80.32	109.33	59.98	102.08	104.71	100.96	56.19	116.06	71.70	34.77	152.30
1914	112.38	93.60	86.97	98.40	89.33	42.52	103.11	82.06	89.26	59.12	101.46	117.45	102.88	65.98	118.14	85.24	40.05	153.00
1915	.....	.....	.....	.....	.....	.....	.....	.....	....	....	106.25	114.96	....	....	....	....	40.55	142.40
1916	.....	.....	.....	.....	.....	.....	.....	.....	....	....	111.88	126.04	....	....	....	....	45.71	169.26
1917	89.75	99.94	94.84	85.86	88.66	75.71	103.02	79.89	97.25	74.39	107.92	210.80	93.39	75.44	103.97	110.93	43.77	161.13
1918	.....	.....	.....	.....	.....	.....	.....	.....	....	....	88.75	148.20	....	....	....	....	48.91	196.47
1919	.....	.....	.....	.....	.....	.....	.....	.....	....	....	104.58	164.54	....	....	....	....	55.17	157.60
1920	108.37	107.28	98.59	109.68	98.77	63.70	111.55	100.98	99.66	75.05	109.79	84.21	110.50	98.89	109.77	102.67	61.02	142.05
1921	.....	.....	.....	.....	.....	.....	.....	.....	....	....	98.75	78.39	....	....	....	....	70.70	120.14
1922	101.05	97.99	106.37	95.92	99.80	100.12	96.97	90.06	100.77	102.26	94.58	102.49	98.68	97.33	99.80	99.28	93.40	97.17
1923	98.21	101.19	96.10	95.55	102.29	88.26	96.74	102.15	99.49	107.22	105.83	121.88	99.48	103.92	98.65	95.74	120.39	99.65
1924	94.55	93.60	97.77	96.61	98.07	112.79	96.70	99.51	98.43	108.17	99.58	103.32	92.41	95.38	96.52	99.58	96.38	98.69
1925	97.82	99.94	101.91	102.25	101.06	135.14	98.04	107.30	101.66	107.31	101.25	93.63	98.93	104.50	95.26	102.72	119.14	83.75
1926	99.37	97.26	99.93	108.02	100.28	123.61	87.39	111.94	102.01	127.57	102.08	105.54	99.24	102.58	100.05	99.10	134.02	74.91
1927	106.47	102.38	104.64	122.41	102.66	141.78	93.94	116.93	108.24	113.43	100.83	124.65	102.88	119.84	104.12	104.25	138.12	66.08

[1] Thousands of koku, not kwan.

[2] Average production in each year 1921-25 in thousands of kwan.

[3] Average value of total production in each year 1921-25 in millions of yen.

TABLE 18. FOOD INDEX III. 1909-1927

	Cereals	Animal Food-stuffs	Vege-tables	Pota-toes	Beans	Fruit	Tea	Combined Food Index
Weight	2271	514	271	142	83	77	34	
1909	92.91	45.65	74.42	83.44	99.89	64.79	83.80	80.99
1910	83.62	31.28	79.74	80.14	94.06	77.27	87.49	79.45
1911	92.06	67.08	85.28	93.14	99.85	76.16	91.04	87.05
1912	90.07	73.66	87.39	91.74	95.93	81.65	94.21	87.20
1913	90.90	75.92	89.61	96.24	75.89	84.40	92.08	88.04
1914	99.61	75.61	91.06	96.70	98.14	87.87	90.91	94.34
1915	98.51	81.56	....	103.54	101.48	82.12	95.98	....
1916	103.64	88.63	....	109.38	99.11	89.49	106.80	....
1917	97.64	84.93	92.93	99.57	95.79	79.05	110.50	95.20
1918	96.95	76.31	....	113.49	91.06	78.40	112.81	....
1919	107.97	81.12	....	132.49	102.39	90.28	109.05	....
1920	110.00	88.45	99.80	117.13	114.45	94.41	101.16	105.53
1921	97.06	90.13	....	106.51	118.46	50.14	94.16	....
1922	105.16	90.25	99.32	99.48	98.61	99.41	98.16	101.68
1923	95.43	100.36	99.58	99.00	92.85	93.84	100.44	96.58
1924	97.98	101.18	97.63	94.76	89.22	101.17	100.05	98.16
1925	104.15	112.09	102.08	100.05	100.75	105.05	107.17	104.93
1926	97.18	104.64	102.42	88.93	78.28	133.42	101.31	98.55
1927	106.43	105.16	108.49	90.10	89.25	121.51	103.39	105.49

CHAPTER V

THE IMPORTS OF FOOD INDEX

Three group indexes have been constructed, showing respectively the physical volume of imports of food from foreign countries, from Korea and from Formosa. The first of these covers the period 1902 to 1927, the second 1907 to 1927, and the third 1910 to 1927. Finally a combined index of imports of food from all sources has been constructed for the period 1910 to 1927.

These indexes may be criticised on the ground that they deal with gross imports and not net imports. Unfortunately it would be very difficult to construct an index of net imports, because some of the food products exported are not imported at all. Kidney beans, for example, are exported but not imported. Obviously we cannot subtract exported kidney beans from imported rice. On the whole an examination of the question led to the conclusion that in view of this difficulty and also because the quantity and value of food exported is very small, no serious loss of accuracy would result from the omission of the factor of food exports.

TABLE 19. IMPORTS OF FOOD FROM FOREIGN COUNTRIES

(Quantities imported in thousands of picul)

Kind of Food	Rice	Wheat	Sugar	Soy Bean	Eggs	Red Bean	Condensed Milk	Salt	Wheat Flour	Other Beans	Other Flours	Horse Bean	Pease	Coffee
Weight[1]	62	56	65	37	16	5	5	4	3	3	2	1	1	1
Base[2]	7,409	8,137	5,621	5,895	481	764	7,937	3,290	353	469	197	212	156	1,020
Year														
1902	4,509	87	2,638	1,801	....	171	377	....	721	16	2	57	31	139
1903	12,162	1,266	3,923	2,202	....	320	427	....	2,092	63	4	138	24	124
1904	14,732	400	4,105	2,161	....	317	502	....	1,914	44	17	121	10	130
1905	11,596	1,026	2,168	2,899	....	131	699	....	1,842	6	22	115	8	151
1906	6,101	355	5,955	2,637	....	105	630	....	1,592	17	4	83	22	159
1907	6,770	904	3,596	2,656	....	122	842	....	1,233	47	3	54	17	127
1908	4,854	594	3,324	3,320	....	90	916	....	518	22	19	71	19	118
1909	3,313	350	2,242	3,623	....	479	888	....	253	51	43	102	30	121
1910	2,297	818	2,003	2,637	....	357	903	....	299	83	24	70	32	114
1911	4,299	909	1,315	2,934	....	216	769	....	294	26	21	70	27	134
1912	5,586	1,024	2,271	2,162	....	243	7,840	....	280	103	4	129	31	140
1913	9,093	2,815	5,437	1,781	....	460	6,969	....	286	144	20	146	32	175
1914	5,057	1,962	3,310	2,516	....	444	5,784	....	201	173	20	136	12	172
1915	1,144	368	2,077	1,980	....	418	4,166	....	30	87	15	120	24	171
1916	773	290	1,061	1,220	....	417	3,795	....	14	37	13	69	45	197
1917	1,411	127	1,316	1,403	....	440	4,558	....	6	62	15	81	58	357
1918	11,618	1,153	3,718	1,953	....	639	3,234	....	102	109	62	378	104	404
1919	11,606	4,299	4,548	2,855	....	806	4,061	....	650	194	28	234	159	533
1920	1,178	2,868	2,869	3,881	265	260	4,701	6,947	233	76	27	157	50	517
1921	3,988	4,921	5,090	2,933	599	530	6,007	3,217	584	350	51	265	93	634
1922	7,610	8,964	6,562	5,135	536	668	7,504	4,769	620	475	205	230	102	791
1923	4,424	7,382	5,006	7,125	519	746	9,543	2,523	340	499	264	214	111	925
1924	8,170	11,689	5,093	7,108	429	942	9,557	3,331	145	497	181	170	149	1,393
1925	12,851	7,727	6,352	7,173	324	935	7,072	2,612	76	522	286	182	210	1,355
1926	5,759	11,717	7,568	7,021	286	1,074	7,231	3,216	121	351	295	155	115	1,762

[1] Average annual value of imports 1921-25 in millions of yen.
[2] Average annual quantity of imports 1921-25 in thousands of picul.

TABLE 20. IMPORTS OF FOOD FROM FOREIGN COUNTRIES. INDEX NUMBERS OF QUANTITIES

Kind of Food	Rice	Wheat	Sugar	Soy Bean	Eggs	Red Bean	Condensed Milk	Salt	Wheat Flour	Other Beans	Other Flours	Horse Beans	Pease	Coffee	Combined Geometric Average
Base	7,409	8,137	5,621	5,895	481	764	7,937	3,290	353	469	197	212	156	1,020	
Weight	62	56	52	37	16	5	5	4	3	3	2	1	1	1	
Year															
1902	60.86	1.07	46.93	30.55	16.01	22.38	4.75	5.62	204.25	3.41	1.02	26.89	23.31	13.63	16.06
1903	164.15	15.56	69.79	37.35	10.60	41.88	5.38	10.27	592.63	13.43	2.03	65.09	18.05	12.16	43.70
1904	198.97	4.92	73.03	36.66	6.03	41.49	6.32	10.49	542.21	9.38	8.63	57.08	7.52	12.75	34.52
1905	156.51	12.61	38.57	49.18	11.02	17.14	8.07	7.51	521.81	1.28	11.17	54.25	6.02	14.80	36.66
1906	82.35	4.36	105.94	44.73	13.31	13.74	7.94	8.91	450.99	3.62	2.03	39.15	16.54	15.59	30.24
1907	91.38	11.11	63.97	45.06	11.23	15.97	10.61	4.71	349.29	10.02	1.52	25.47	12.78	12.45	34.21
1908	65.51	7.30	59.14	56.32	15.59	11.78	11.54	16.66	146.74	4.69	9.64	33.49	14.29	11.57	30.11
1909	44.72	4.30	39.89	61.46	18.92	62.70	11.19	13.40	71.67	10.87	21.83	48.11	22.56	11.86	23.90
1910	31.00	10.05	35.63	44.73	18.09	46.73	11.38	9.60	84.70	17.70	12.18	33.02	24.06	11.18	24.31
1911	58.02	11.17	23.39	49.77	12.89	28.27	9.69	19.33	83.29	5.54	10.66	33.02	20.30	13.14	26.05
1912	75.39	12.58	40.40	36.68	14.14	31.81	98.78	10.52	79.32	21.96	2.03	60.85	23.31	13.73	32.22
1913	122.73	34.58	96.73	30.21	17.05	60.21	87.80	20.24	81.02	30.70	10.15	68.87	24.06	17.16	56.18
1914	71.74	24.11	58.89	42.68	16.22	58.12	72.87	24.89	56.94	36.89	10.15	64.15	9.02	16.86	42.51
1915	15.44	4.52	36.95	33.59	16.01	54.71	52.49	13.77	8.50	18.55	7.61	56.60	18.05	16.76	16.52
1916	10.43	3.56	18.88	20.70	12.89	54.58	47.81	24.50	3.97	7.89	6.60	32.55	33.83	19.31	11.17
1917	19.04	1.56	23.41	23.80	9.15	57.59	57.43	50.67	1.70	13.22	7.61	38.21	43.61	35.00	11.68
1918	156.81	14.17	66.14	33.13	13.72	83.64	40.75	128.66	28.90	23.24	31.47	178.30	78.20	39.61	46.28
1919	156.65	52.83	80.91	48.43	22.04	105.50	51.17	247.78	184.14	41.36	14.21	110.38	119.55	52.25	74.06
1920	15.90	35.25	51.04	65.84	55.09	34.03	59.23	211.16	66.01	16.20	13.70	74.06	37.59	50.69	36.49
1921	53.83	60.48	90.55	49.75	124.53	69.37	75.68	97.78	165.44	74.63	25.89	125.00	69.92	62.16	66.81
1922	102.71	110.16	116.74	87.11	111.43	87.43	94.54	144.95	175.64	101.28	104.06	108.49	76.69	77.55	105.66
1923	59.71	90.72	89.06	120.87	107.90	97.64	120.23	76.69	96.32	106.40	134.01	100.94	83.46	90.69	86.81
1924	110.27	143.65	90.61	120.58	89.19	123.30	120.41	101.25	41.08	105.97	91.88	80.19	112.03	136.57	111.00
1925	173.45	94.96	113.00	121.68	67.35	122.38	89.10	79.39	21.53	111.30	145.18	85.85	157.89	132.57	115.20
1926	77.73	144.00	134.64	119.10	59.46	140.58	91.10	97.75	34.28	74.84	149.75	73.11	73.72	172.74	106.76

TABLE 21

IMPORTS OF FOOD FROM KOREA
QUANTITIES IMPORTED IN THOUSANDS OF KOKU

	Rice	Soy Bean	Fresh Fish	Dried Fish		Rice	Soy Bean	Fresh Fish	Dried Fish
Base	3,826	1,365	91,816	15,589	Base	3,826	1,365	91,816	15,589
Weight	126	22	8	5	Weight	126	22	8	5
1910	1,220	1,692	1,231	1,596	1919	2,665	1,279	68,032	14,723
1911	701	1,442	462	1,562	1920	1,811	834	60,722	12,799
1912	701	1,652	928	3,624	1921	3,072	1,749	85,550	14,049
1913	919	1,698	1,201	5,078	1922	2,961	1,434	83,246	13,121
1914	1,092	533	1,750	5,700	1923	3,875	1,268	115,925	17,834
1915	2,116	1,001	1,601	6,884	1924	4,673	1,388	109,296	16,945
1916	1,194	928	1,554	10,061	1925	4,549	986	65,068	15,995
1917	1,066	1,056	3,788	11,978	1926	5,543	1,394	77,929	14,156
1918	4,963	954	50,954	12,269	1927	6,153	1,441	61,370	14,765

TABLE 22

IMPORTS OF FOOD FROM KOREA
INDEX NUMBERS OF QUANTITIES

Kind of Food	Rice	Soy Bean	Fresh Fish	Dried Fish	All Imports from Korea
Base	3,826	1,365	91,816	15,589	
Weight	126	22	8	5	
Year					
1910	31.89	123.96	1.34	10.24	31.65
1911	18.32	105.64	0.50	10.79	19.14
1912	18.32	121.03	1.01	23.25	20.68
1913	24.02	124.44	1.31	32.57	26.27
1914	28.54	39.05	1.91	36.56	26.24
1915	55.31	73.33	1.74	44.16	53.89
1916	31.21	68.72	1.69	64.54	30.76
1917	27.89	77.36	4.13	76.84	30.09
1918	129.72	72.82	55.50	78.70	113.16
1919	69.92	113.63	74.10	94.44	75.64
1920	47.33	61.10	66.13	82.10	50.69
1921	80.29	128.13	93.17	90.12	86.47
1922	77.39	105.05	90.67	84.17	81.54
1923	101.31	92.89	126.26	114.40	101.60
1924	122.14	101.76	119.04	108.70	118.55
1925	118.90	72.23	70.87	102.60	107.76
1926	144.88	102.12	84.87	90.80	132.56
1927	160.82	105.57	66.85	94.71	142.98

TABLE 23

IMPORTS OF FOOD FROM FORMOSA
QUANTITIES IN THOUSANDS OF KIN

Kind of Food	Rice	Sugar	Bananas	Katsuo-bushi	Preserved Pineapple	Salt
Weight[1]	36	101	8	2	1	1
Base[2]	338,596	611,602	119,523	1,316	323[3]	127,528
Year						
1907	139,576	94,228	816	34	6	49,590
1908	254,398	103,536	2,478	53	22	35,325
1909	247,874	209,747	4,448	65	20	41,477
1910	171,063	306,739	8,555	161	14	64,250
1911	154,781	395,820	12,368	142	30	65,373
1912	152,464	247,165	10,601	257	51	61,019
1913	265,429	102,720	8,819	282	66	48,447
1914	141,159	227,440	14,661	205	64	92,902
1915	200,538	348,612	18,693	463	66	85,368
1916	156,030	424,824	32,690	847	91	111,358
1917	188,206	562,897	49,970	548	91	129,755
1918	255,803	453,442	46,824	958	108	157,768
1919	276,477	484,916	46,004	671	149	47,652
1920	166,304	366,014	13,848	791	159	35,489
1921	248,626	424,256	43,557	1,094	210	49,342
1922	168,185	575,651	97,825	1,399	210	99,101
1923	291,048	627,020	125,081	1,530	279	118,313
1924	429,235	714,065	182,817	1,408	411	216,408
1925	555,887	717,019	148,336	1,147	504	154,479
1926	567,881	748,792	186,577	1,538	488	115,683
1927	677,205	692,807	151,252	1,499	868	72,879

[1] Average annual value of imports 1921-5 in millions of yen.

[2] Average annual imports 1921-5 in thousands of kin.

[3] Unit: dozens, not kin.

TABLE 24

IMPORTS OF FOOD FROM FORMOSA. INDEX NUMBERS OF QUANTITIES

	Rice	Sugar	Bananas	Katsuo-bushi	Preserved Pineapples	Salt	All Imports of Food from Formosa
Base[1]	338,596	611,602	119,523	1,316	323[3]	127,528	
Weight[2]	36	101	8	2	1	1	
1907	41.22	15.41	0.68	2.58	1.86	38.89	16.01
1908	75.14	16.93	2.07	4.03	6.81	27.70	21.21
1909	73.21	34.29	3.72	4.94	6.19	32.52	35.20
1910	50.52	50.15	7.16	12.23	4.33	50.38	43.68
1911	45.71	64.71	10.35	10.79	9.29	51.26	51.88
1912	45.03	40.41	8.87	19.53	15.79	47.85	37.67
1913	78.39	16.80	7.38	21.43	20.43	37.99	26.66
1914	41.69	37.19	12.27	15.58	19.81	72.85	35.61
1915	59.23	57.00	15.64	35.18	20.43	66.94	53.02
1916	46.08	69.46	27.35	64.36	28.17	87.32	59.50
1917	55.58	92.04	41.81	41.64	28.17	101.75	76.71
1918	75.55	74.14	39.18	72.80	33.44	123.71	71.82
1919	81.65	79.29	38.49	50.99	46.13	37.37	75.68
1920	49.12	59.85	11.59	60.11	49.23	27.83	51.91
1921	73.43	69.37	36.44	83.13	65.02	38.69	67.81
1922	49.67	94.12	81.85	106.31	65.02	77.71	79.88
1923	85.96	102.52	104.65	116.26	86.38	92.77	98.34
1924	126.77	116.85	152.96	106.99	127.24	169.69	121.14
1925	164.17	117.24	124.11	87.16	156.04	121.13	127.33
1926	167.72	122.43	156.10	116.87	151.08	90.71	133.67
1927	200.00	113.28	126.55	113.91	268.73	57.15	130.90

[1] Average annual imports 1921-5 in thousands of kin.

[2] Average annual value of imports 1921-5 in millions of yen.

[3] Unit: dozens, not kin.

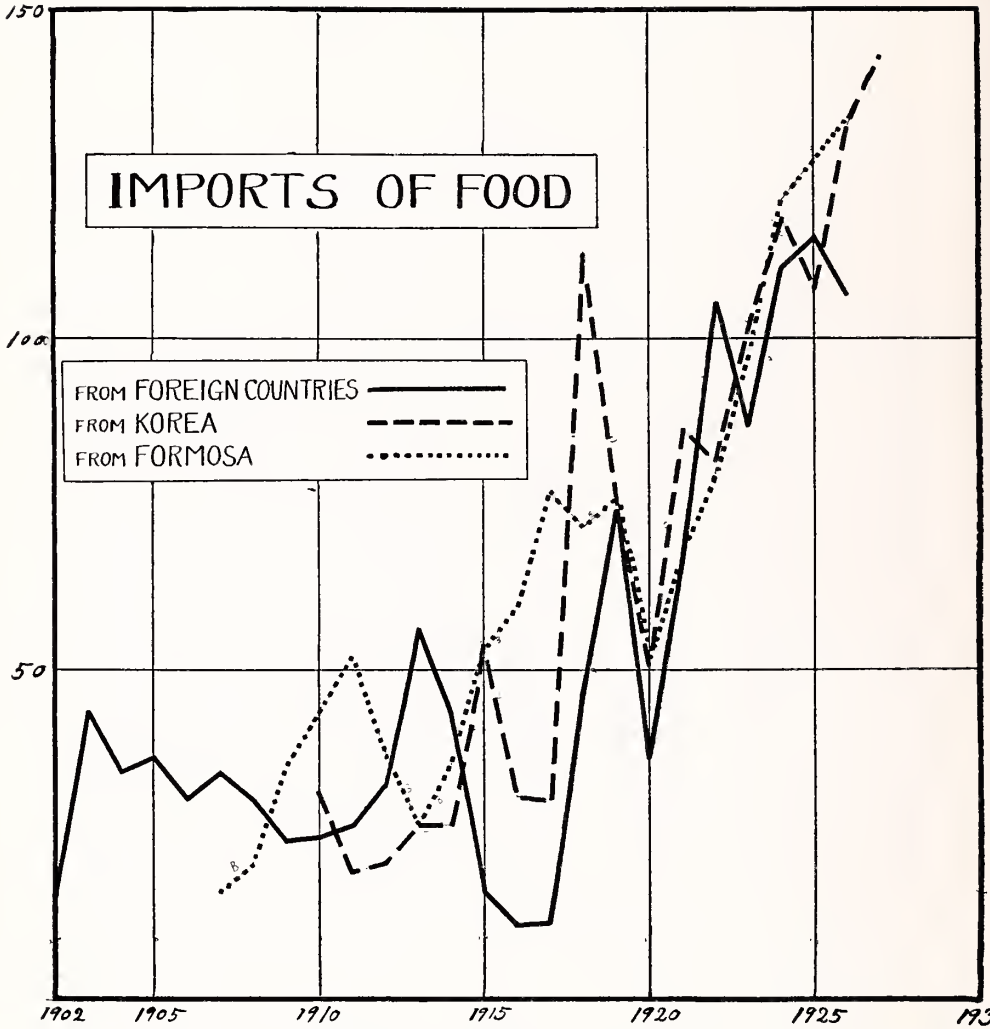


DIAGRAM F. GRAPH SHOWING IMPORTS OF FOOD FROM KOREA, FORMOSA AND FOREIGN COUNTRIES

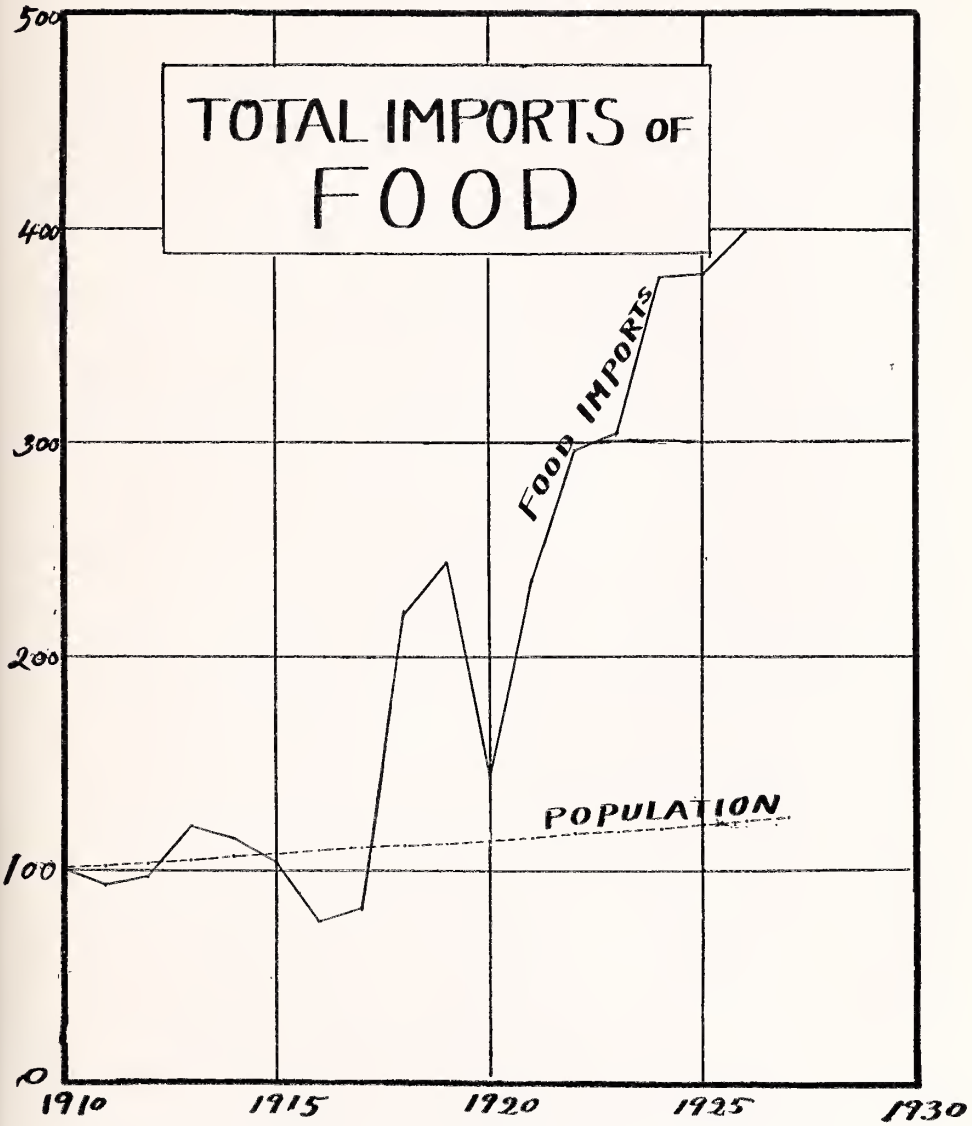


DIAGRAM G. GRAPH SHOWING TOTAL IMPORTS OF FOOD

CHAPTER VI

THE AGRICULTURAL INDEXES

The greater number of the products included in these indexes are also in the food indexes. It seemed therefore unnecessary to repeat the tables for these products. There are two agricultural indexes: the first, from 1906 to 1927, contains all the products in the corresponding food index except the fisheries group. Two new series are added, silk cocoons and industrial crops. The second index, from 1909 to 1927, contains all the products in the first with the addition of vegetables.

It will be seen from the weights that the production of silk cocoons is of great importance and the growth of their production in modern Japan has played a considerable part in economic development.

Reference should be made to the chart shown in the food index section for a graphical representation of Agricultural Index I compared with population and food.

TABLE 25

SILK COCOONS

Weight	604		Weight	604	
Base	7.041		Base	7.041	
	Quantities[1]	Index		Quantities[1]	Index
1894	1,798	25.53	1910	3,901	55.40
1895	2,258	32.07	1911	4,235	60.15
1896	1,831	26.01	1912	4,452	63.23
1897	2,122	30.14	1913	4,592	65.21
1898	2,027	28.79	1914	4,412	62.67
1899	2,513	35.69	1915	4,647	66.01
1900	2,754	39.11	1916	5,708	81.08
1901	2,526	35.88	1917	6,370	90.48
1902	2,549	36.21	1918	6,832	97.03
1903	2,587	36.74	1919	7,222	102.54
1904	2,826	40.13	1920	6,333	89.95
1905	2,723	38.68	1921	6,333	89.94
1906	2,971	42.19	1922	6,056	86.01
1907	3,457	49.10	1923	6,954	98.77
1908	3,530	50.14	1924	7,382	104.84
1909	3,630	51.55	1925	8,480	120.44

[1] Unit: 10,000 koku.

TABLE 26. INDUSTRIAL CROPS. QUANTITIES OF PRODUCTION

	Tobacco Leaves	Sugar Cane	Rape Seed	Konnyaku Imo	Rush	Hemp	Shichitoi	Dalmatia	Peppermint	Kozo	Mitsumata	Waxberries
Weight[1]	47	13	12	10	9	8	4	4	4	4	4	2
Base[2]	17,137	236,932	654	11,682	11,434	2,500	4,236	830	5,989	5,256	5,268	7,336
Year												
1905	10,878	205,902	1,019	.....	10,148	2,249	3,337	34	3,369	7,435	4,891	19,380
1906	11,733	105,694	....	.....	6,864	2,887	4,358	27	2,508	8,307	5,627	12,092
1907	12,143	159,222	1,057	.....	11,530	2,597	3,604	27	3,393	8,416	6,142	18,344
1908	11,053	171,016	1,211	.....	11,150	2,332	4,232	36	2,288	8,583	5,645	16,912
1909	11,110	188,185	1,052	.....	9,211	2,487	4,176	59	1,305	8,147	5,359	18,923
1910	11,344	219,871	1,048	.....	8,840	2,430	3,895	104	3,332	7,601	5,795	17,522
1911	9,059	229,179	1,050	.....	9,665	2,552	4,185	100	4,053	7,814	6,337	16,713
1912	11,624	212,796	1,022	.....	11,143	2,377	4,220	125	6,344	7,175	6,663	15,525
1913	13,542	230,172	907	.....	9,605	2,673	4,443	221	11,076	6,787	5,853	15,633
1914	15,266	266,955	883	.....	8,902	2,525	3,976	257	21,656	6,964	5,693	14,565
1915	13,114	263,866	877	.....	8,678	2,474	3,650	263	15,384	7,088	6,537	14,232
1916	12,778	281,136	870	.....	9,514	2,264	4,096	524	17,137	7,191	6,047	15,072
1917	10,960	407,929	854	11,257	13,442	2,366	4,238	820	8,656	6,786	5,559	14,363
1918	9,650	316,746	857	8,921	10,434	2,564	3,450	721	3,380	6,964	5,918	13,761
1919	13,712	287,053	931	9,016	9,641	2,564	4,072	485	2,206	6,948	5,672	10,730
1920	16,695	234,098	901	9,455	9,062	2,334	4,598	469	3,503	7,638	5,946	10,874
1921	16,317	295,718	806	10,055	8,593	3,188	3,910	452	4,216	6,206	6,632	9,124
1922	18,551	216,664	681	10,210	9,802	3,151	3,807	492	4,229	5,626	5,698	7,875
1923	16,464	193,599	611	11,302	10,926	1,802	4,271	586	4,909	5,098	5,058	7,275
1924	17,003	255,705	586	12,475	14,915	2,231	4,287	979	6,290	4,762	4,554	6,203
1925	17,349	222,976	587	14,366	12,933	2,130	4,904	1,642	10,301	4,588	4,398	6,201
1926	16,751	242,781	580	14,663	11,447	2,489	4,877	1,934	11,087	4,201	3,897	5,830
1927	18,183	234,121	597	14,387	11,049	2,256	4,528	1,283	10,555	3,907	3,685	5,609

[1] Average annual value of production 1921-25 in millions of yen.
[2] Average annual amount of production 1921-25 in thousands of kwan (Rape-seed: thousands of koku).

TABLE 27

INDUSTRIAL CROPS—INDEX NUMBERS OF PRODUCTION

	Tobacco Leaves	Sugar Cane	Rape Seed	Konnyaku Imo	Rush	Hemp	Shichitoi	Dalmatia	Peppermint	Kozo	Mitsumata	Waxberries
Base	17,137	236,932	654	11,682	11,434	2,500	4,236	830	5,989	5,658	5,317	7,336
Weight	47	13	12	10	9	8	4	4	4	4	4	2
1905	63.48	86.90	155.81	81.12	88.75	89.96	78.78	4.10	56.25	141.46	92.84	264.18
1906	68.47	44.61	171.10	76.82	60.03	115.48	102.88	3.25	41.88	158.05	106.81	164.83
1907	70.86	67.20	161.62	72.81	100.84	103.88	85.08	3.25	56.65	160.12	116.59	250.05
1908	64.50	72.18	185.17	82.13	97.52	93.28	99.91	4.34	38.20	163.30	107.16	230.53
1909	64.83	79.43	160.86	74.64	80.56	99.48	98.58	7.11	21.79	155.00	101.73	257.95
1910	66.20	92.80	160.24	80.94	77.31	97.20	91.95	12.53	55.64	144.62	113.42	238.85
1911	52.86	96.73	160.55	96.02	84.53	102.08	98.80	12.05	67.67	148.67	120.29	227.82
1912	67.83	89.81	156.27	103.70	97.45	95.08	99.62	15.06	105.93	136.51	126.48	211.63
1913	79.02	97.15	138.69	86.41	84.00	106.92	104.89	26.63	184.94	129.13	110.10	213.10
1914	89.08	112.67	135.02	81.40	77.86	101.00	93.86	30.96	361.60	132.50	108.07	198.54
1915	76.52	111.37	134.10	93.02	75.90	98.96	86.17	31.69	256.87	134.86	124.09	194.00
1916	74.56	118.66	133.03	97.55	83.21	90.56	96.69	63.13	286.14	136.82	114.79	205.45
1917	63.96	172.17	130.58	96.36	117.56	94.64	100.05	98.80	144.53	129.11	105.52	195.79
1918	56.31	133.69	131.04	76.37	91.25	102.56	81.44	86.87	56.44	132.50	112.34	187.58
1919	80.01	121.15	142.35	77.18	84.32	102.56	96.13	58.43	36.83	122.79	107.67	146.25
1920	96.84	98.80	137.77	80.94	79.25	93.36	108.55	56.50	58.49	145.32	112.87	148.23
1921	95.22	124.81	123.24	86.07	75.16	127.52	92.30	54.46	70.40	118.08	125.89	124.37
1922	108.25	91.45	104.13	87.40	85.73	126.04	89.87	59.28	70.61	107.04	108.16	107.35
1923	96.09	81.71	93.42	96.75	95.56	72.08	100.83	70.60	81.97	96.99	96.01	99.17
1924	99.22	107.92	89.60	106.79	130.44	89.24	101.20	117.95	105.03	90.60	86.45	84.56
1925	101.24	94.11	89.76	122.98	113.11	85.20	115.77	199.83	172.00	87.29	83.49	84.53
1926	97.74	102.47	88.69	125.52	100.12	99.56	115.13	233.01	185.12	79.93	73.97	79.47
1927	106.10	98.81	91.29	123.16	96.63	90.24	106.89	154.58	176.24	74.33	69.95	76.46

TABLE 28. AGRICULTURAL INDEX I AND FOOD INDEX II

	Agriculture	Food		Agriculture	Food
1906	70.28	71.93	1917	95.66	95.41
1907	76.39	76.31	1918	95.94	93.38
1908	79.21	80.03	1919	105.26	103.37
1909	80.10	81.58	1920	103.29	106.04
1910	76.31	79.42	1921	96.42	95.21
1911	83.52	87.20	1922	100.16	101.89
1912	83.09	87.19	1923	96.10	96.33
1913	83.91	87.90	1924	99.29	98.20
1914	89.10	94.63	1925	106.96	105.19
1915	90.03	95.36	1926	101.29	98.22
1916	97.59	100.80	1927	108.56	105.24

TABLE 29. AGRICULTURAL INDEX I, FOOD AND POPULATION

	Agriculture [1]	Food [1]	Population		Agriculture[1]	Food[1]	Population
1907	100.00	100.00	100.00	1918	125.59	122.37	116.08
1908	103.69	104.87	101.58	1919	137.79	135.46	117.21
1909	104.86	106.91	102.94	1920	135.22	138.96	118.64
1910	99.90	104.08	104.43	1921	126.22	124.77	120.23
1911	109.33	114.27	106.01	1922	131.12	133.52	121.79
1912	108.77	114.26	107.59	1923	125.80	126.24	123.43
1913	109.84	115.19	109.30	1924	129.98	128.69	125.12
1914	116.64	124.01	110.90	1925	140.02	137.85	127.09
1915	117.86	126.27	112.53	1926	132.60	128.72	129.06
1916	127.75	132.09	113.96	1927	142.11	137.91	130.81
1917	125.23	125.03	115.40				

[1] Base shifted from 1921-25 to 1907.

TABLE 30. AGRICULTURAL INDEX II

	Base 1921-1925	Base 1909		Base 1921-1925	Base 1909
1909	79.33	100.00	1919	.....	.....
1910	76.57	96.52	1920	102.99	129.82
1911	83.49	105.24	1921	.....	.....
1912	83.37	105.09	1922	100.09	126.17
1913	84.31	106.28	1923	96.29	121.38
1914	89.22	112.47	1924	99.20	125.05
1915	.....	.....	1925	106.56	134.32
1916	.....	.....	1926	101.94	128.50
1917	95.09	119.87	1927	108.81	137.16
1918	.....	.....			

CHAPTER VII

THE MINERAL INDEX

If we judge only from the physical volume of production and from values, mineral production plays only a very small part in the economic life of Japan as compared with the part played by agriculture. The sum of the weights assigned to all agricultural products in the third agricultural index is 3703, while that for all mineral products amounts to only 343.

Data for minerals exist over a long period, roughly half a century. It will be noticed that production started from an extremely low point.

In the tables metallic minerals are placed first and non-metallic minerals next. Separate indexes are computed for these two groups and a combined index for all minerals.

Zinc production starts very late in the period and though the figures are given in the tables for reference they are omitted in averaging the series to obtain the combined index.

TABLE 31. MINERALS. QUANTITIES OF PRODUCTION
(Unit in thousands)

	Copper	Gold	Silver	Pig Iron	Zinc	Iron Pyrites	Coal	Petroleum	Sulphur	Lignite
Weight	43	11	6	6	5	3	243	23	2	1
Base	99,324	2,062	32,089	73,192	22,566	54,167	28,888	1,712	40,648	162
	Kin	Kwan	Kwan	Ton	Kin	Kwan	Ton	Koku	Ton	Ton
1877	6,571	93	2,945	8	.....	.....	499	10	1	.....
1878	7,094	73	2,638	10	.....	.....	680	19	2	.....
1879	7,718	70	2,423	13	.....	.....	858	25	2	.....
1880	7,782	83	2,757	16	.....	.....	882	37	1	.....
1881	7,953	81	4,763	16	.....	.....	925	18	1	.....
1882	9,360	72	4,635	12	.....	.....	929	21	3	.....
1883	11,291	80	6,435	15	.....	.....	1,003	22	7	.....
1884	14,814	73	6,107	12	.....	.....	1,140	6	4	.....
1885	17,568	73	6,356	7	.....	.....	1,294	7	5	.....
1886	16,290	124	8,983	14	.....	.....	1,374	13	6	.....
1887	18,440	139	9,498	15	.....	.....	1,746	9	11	.....
1888	22,291	168	11,397	18	.....	.....	2,023	40	20	.....
1889	27,090	205	11,458	21	.....	.....	2,389	56	17	.....
1890	30,192	194	14,092	22	.....	.....	2,628	54	22	.....
1891	31,722	193	15,645	17	.....	65	3,176	56	22	.....
1892	34,545	187	16,063	20	.....	605	3,176	73	20	.....
1893	30,025	196	18,469	17	.....	112	3,320	94	24	.....
1894	33,186	210	19,210	20	.....	1,374	4,268	152	19	.....
1895	21,857	339	19,273	26	.....	1,687	4,773	149	16	.....
1896	33,465	257	17,157	27	.....	2,370	5,020	208	13	.....
1897	33,982	279	14,478	28	.....	2,034	5,208	231	14	.....
1898	35,040	327	16,118	24	.....	2,327	6,739	281	11	.....
1899	40,460	486	14,978	23	.....	2,234	6,751	474	11	.....
1900	42,182	668	15,682	25	.....	4,311	7,472	767	15	.....
1901	45,653	943	14,599	29	.....	4,690	9,011	984	18	10

TABLE 31. MINERALS. QUANTITIES OF PRODUCTION (Continued)
(Unit in thousands)

	Copper	Gold	Silver	Pig Iron	Zinc	Iron Pyrites	Coal	Petroleum	Sulphur	Lignite
Weight	43	11	6	6	5	3	243	23	2	1
Base	99,324	2,062	32,089	73,192	22,566	54,167	28,888	1,712	40,648	162
	Klu	Kwan	Kwan	Ton	Kin	Kwan	Ton	Koku	Ton	Ton
1902	48,391	1,194	15,371	32	.....	4,955	9,799	878	20	41
1903	55,312	1,158	15,627	34	.....	4,299	10,170	1,065	25	50
1904	53,538	1,102	16,404	38	.....	6,636	10,806	1,074	29	48
1905	59,158	1,233	22,216	46	.....	6,818	11,637	1,190	26	51
1906	64,191	1,103	21,098	43	.....	9,591	13,083	1,383	29	71
1907	67,064	1,113	25,637	44	.....	14,978	13,939	1,520	35	71
1908	69,538	1,401	33,119	42	.....	9,031	14,979	1,648	35	83
1909	76,402	1,049	34,111	47	.....	5,736	15,048	1,657	37	99
1910	82,206	1,165	37,763	59	.....	21,247	15,681	1,608	44	100
1911	89,003	1,249	36,811	53	.....	19,666	17,633	1,530	50	97
1912	104,037	1,373	39,996	57	.....	20,235	19,640	1,458	55	108
1913	110,835	1,477	39,007	57	.....	30,554	21,316	1,694	59	100
1914	117,439	1,917	40,252	74	9,855	30,874	22,293	2,358	74	105
1915	125,693	2,212	42,470	65	35,219	18,010	20,491	2,613	72	100
1916	167,726	2,104	48,180	77	64,989	24,271	22,902	2,593	106	109
1917	180,064	1,887	58,992	119	91,197	32,365	26,361	2,509	118	153
1918	150,569	2,052	54,744	180	66,526	28,202	28,029	2,143	65	173
1919	130,739	1,939	42,822	209	33,027	33,866	31,271	1,964	51	190
1920	112,987	2,058	40,577	169	26,241	36,908	29,245	1,950	40	178
1921	91,596	1,967	34,734	97	17,289	25,330	26,221	1,961	37	147
1922	90,210	2,007	32,841	75	20,877	43,068	27,702	1,799	35	166
1923	98,910	2,051	29,837	90	22,967	60,284	28,949	1,576	37	151
1924	105,039	2,027	29,381	47	23,448	58,788	30,111	1,580	47	177
1925	110,812	2,257	33,652	57	28,250	83,367	31,459	1,637	48	169
1926	112,276	2,426	39,134	75	28,288	111,337	31,427	1,496	48	161

TABLE 32. MINERALS. INDEX NUMBERS OF PRODUCTION

	Copper	Gold	Silver	Pig Iron	Zinc	Iron Pyrites	Coal	Petroleum	Sulphur	Lignite	All Minerals
1877	6.62	4.51	9.18	11.21	.....	.....	1.73	0.58	0.26	.....	2.11
1878	7.14	3.54	8.22	13.87	.....	.....	2.35	1.11	5.25	.....	2.80
1879	7.77	3.39	7.24	17.28	.....	.....	2.79	1.46	4.31	.....	3.38
1880	7.83	4.03	8.59	22.03	.....	.....	3.05	1.58	2.93	.....	3.51
1881	8.01	3.93	14.81	22.00	.....	.....	3.20	1.05	1.72	.....	3.56
1882	9.42	3.49	14.44	16.60	.....	.....	3.22	1.23	8.37	.....	3.69
1883	11.37	3.88	20.05	16.60	.....	.....	3.47	1.29	17.07	.....	4.07
1884	14.91	3.54	19.03	16.18	.....	.....	3.95	0.35	10.53	.....	4.19
1885	17.69	3.54	19.03	9.24	.....	.....	4.48	0.41	12.18	.....	4.73
1866	16.38	6.01	27.99	18.78	.....	.....	4.76	0.76	15.86	.....	5.31
1887	18.57	6.74	29.60	20.83	.....	.....	6.04	0.53	26.52	.....	6.29
1888	22.44	8.15	35.52	24.83	.....	.....	7.00	2.34	48.25	.....	8.07
1889	27.27	9.89	35.71	28.88	.....	.....	8.27	3.27	41.53	.....	9.65
1890	30.40	9.41	43.92	30.59	.....	.....	9.10	3.16	53.24	.....	10.52
1891	31.94	9.36	48.76	23.62	.....	0.12	10.99	3.27	53.95	.....	11.56
1892	34.78	9.07	50.06	26.96	.....	1.12	10.99	4.27	50.40	.....	12.24
1893	30.23	9.51	57.56	23.83	.....	0.20	11.49	5.49	58.77	.....	12.65
1894	33.41	10.18	59.86	26.66	.....	2.54	14.77	8.88	46.14	.....	16.06
1895	32.07	16.44	60.06	35.20	.....	3.11	16.52	8.77	38.21	.....	17.68
1896	33.69	12.46	53.47	37.12	.....	4.38	17.38	12.16	30.80	.....	18.71
1897	34.21	13.53	45.12	38.20	.....	3.76	18.03	13.50	33.41	.....	19.37
1898	35.28	15.86	50.23	32.22	.....	4.30	23.33	16.42	26.74	.....	23.83
1899	40.74	23.57	46.68	30.96	.....	4.12	23.37	27.70	26.60	.....	25.45
1900	42.47	32.40	48.87	33.90	.....	7.96	25.87	44.83	37.34	.....	29.05
1901	45.96	46.54	45.50	40.25	.....	8.66	31.20	57.51	44.75	0.60	34.27
1902	48.72	57.90	47.90	43.91	.....	9.15	33.92	51.32	49.01	25.29	36.84
1903	55.69	56.16	48.70	46.21	.....	7.94	35.21	62.24	61.32	30.93	39.41
1904	53.90	53.44	51.12	52.13	.....	12.94	37.41	62.77	70.72	29.75	41.26
1905	59.56	59.80	69.23	62.19	.....	12.59	40.28	69.55	63.54	31.37	44.91
1906	64.63	53.49	65.76	58.33	.....	17.71	45.29	80.83	71.67	44.00	52.24
1907	67.55	53.98	79.89	60.65	.....	27.65	48.25	88.84	85.24	43.69	53.28
1908	70.01	67.94	103.21	57.32	.....	16.67	51.85	96.32	87.06	51.14	57.08
1909	76.92	50.87	106.30	64.65	.....	10.59	52.09	96.84	90.78	61.13	57.41
1910	82.77	56.50	117.63	80.47	.....	39.22	54.28	93.98	107.87	61.69	60.87
1911	86.61	60.57	114.72	72.41	.....	36.31	61.04	89.42	123.68	59.83	66.68
1912	104.73	66.59	124.64	77.50	.....	37.36	67.95	85.21	134.21	66.55	73.73
1913	111.59	71.63	121.56	77.84	.....	56.41	73.79	99.01	146.25	61.42	80.15
1914	118.24	92.97	125.44	101.62	43.67	57.00	77.17	137.81	182.33	64.85	87.53
1915	126.55	107.27	132.35	88.90	156.07	33.25	70.93	152.72	177.64	61.71	82.63
1916	168.87	102.04	150.14	105.58	288.00	44.81	73.28	151.55	261.73	67.02	93.63
1917	181.29	91.51	183.84	162.64	404.13	59.75	91.25	146.64	290.51	94.25	105.55
1918	156.75	99.52	170.60	245.78	294.81	52.07	97.03	125.25	159.20	106.89	107.60
1919	138.33	94.03	133.45	285.91	146.36	62.52	108.24	114.79	124.56	117.30	113.54
1920	113.76	99.81	126.45	230.75	116.29	68.14	101.24	113.97	97.42	109.96	105.11
1921	92.22	95.39	108.24	132.05	76.62	46.76	90.77	114.61	90.02	90.72	92.91
1922	90.82	97.33	102.34	102.68	92.52	79.51	95.89	105.14	85.22	102.51	95.85
1923	99.58	99.47	92.98	122.48	101.78	111.29	100.21	92.17	92.05	93.37	99.70
1924	105.81	98.30	91.56	64.70	103.92	108.53	104.23	92.34	115.31	108.65	102.38
1925	111.57	109.46	104.87	78.10	125.19	153.91	108.90	95.68	117.39	104.44	108.06
1926	113.04	117.65	115.72	102.87	125.35	205.54	108.79	87.47	117.53	99.33	108.53

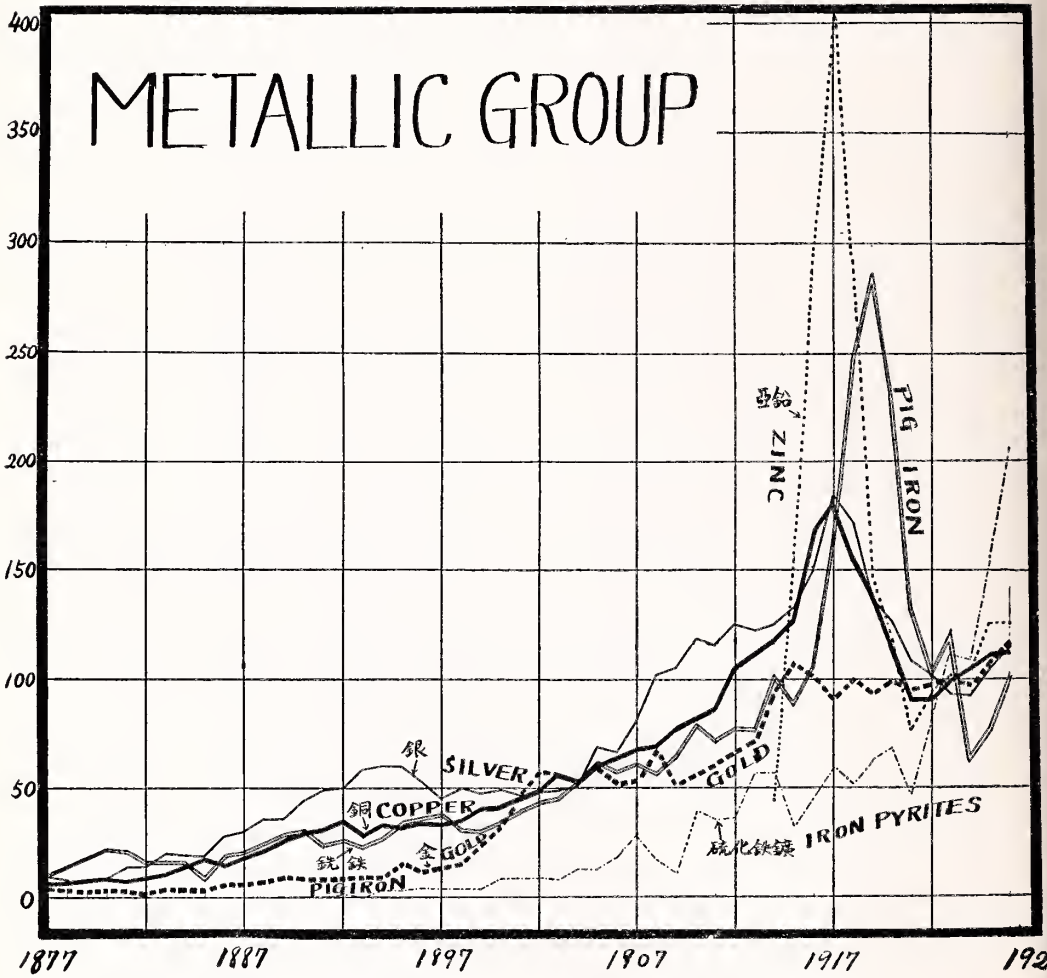


DIAGRAM H. GRAPH SHOWING MINERAL PRODUCTION IN THE METALLIC GROUP

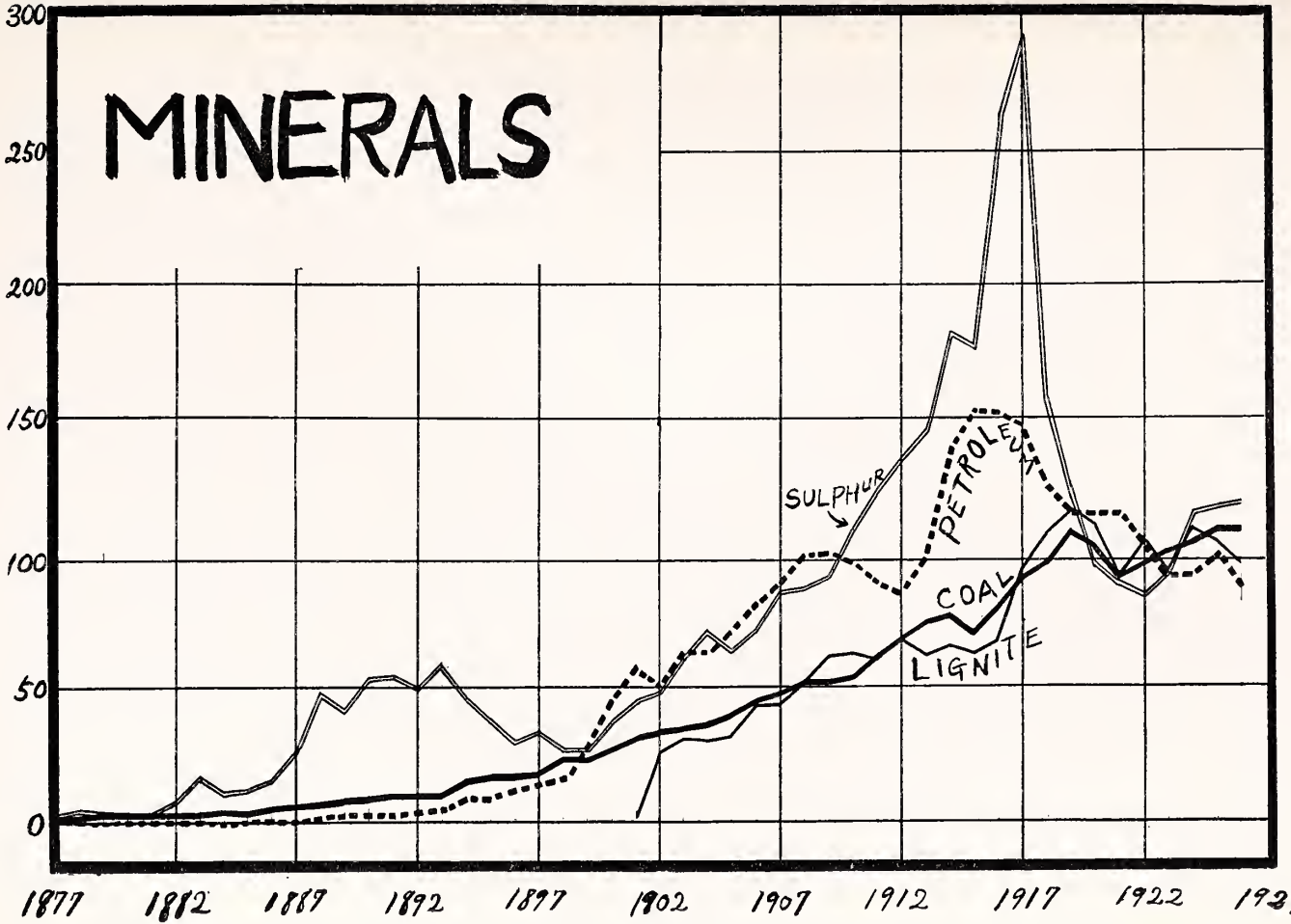


DIAGRAM I. GRAPH SHOWING MINERAL PRODUCTION IN THE NON-METALLIC GROUP

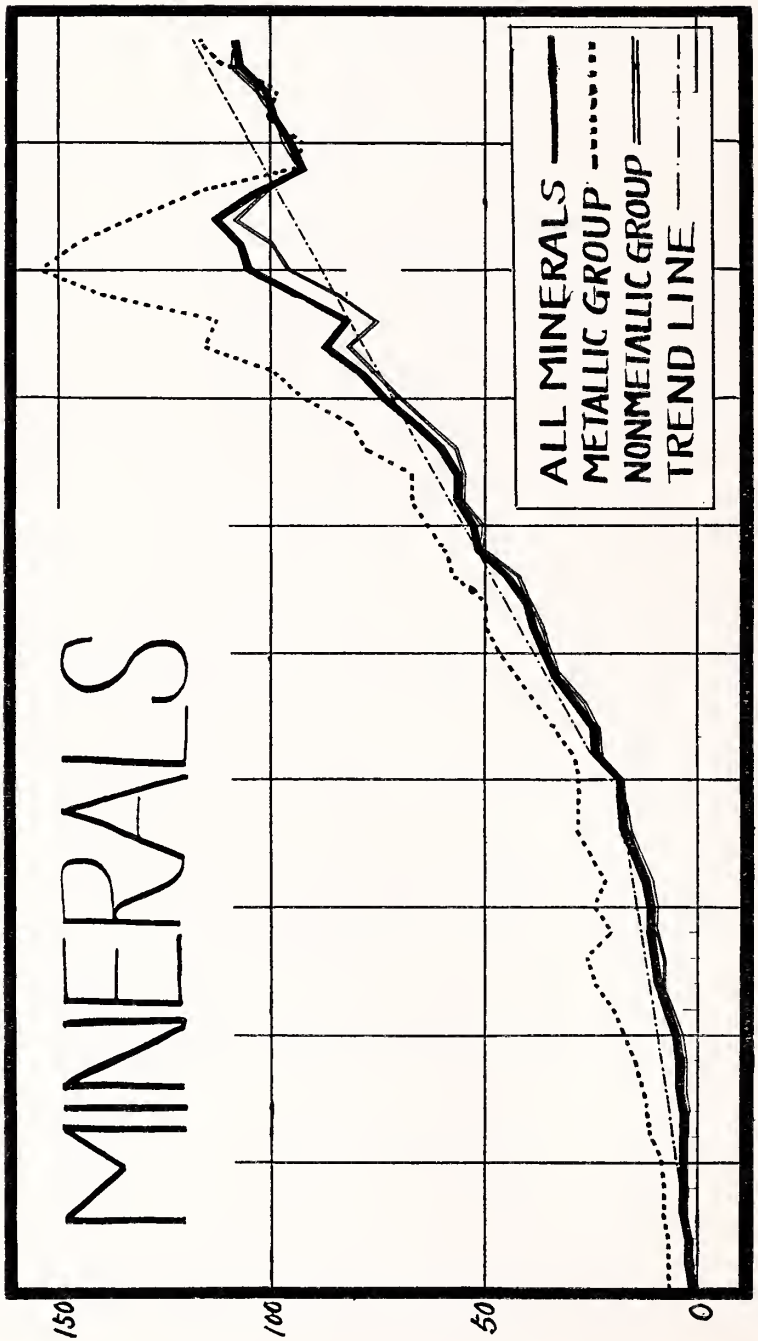


DIAGRAM J. GRAPH SHOWING MINERAL PRODUCTION IN ALL GROUPS

CHAPTER VIII

CONCLUSION

There is a familiar gibe that "you can prove anything by statistics." It has been well pointed out that, so far from this being true, in reality it is nearer the truth, though not entirely true, to say that you can prove nothing by statistics. To infer from this, however, that statistics are valueless would be a gross error. The correct inference is that the results of a statistical investigation should be checked, analysed, and thoroughly tested by all other knowledge, some of it being of a non-statistical nature, relevant to the investigation in hand. The student of statistics must not work *in vacuo*. His results must be pooled with the results obtained by other lines of approach. When this is done, it will be seen that the statistical approach is an indispensable part of the approach as a whole to modern economic problems.

It is difficult, however, for one individual, especially when he is a foreigner in the country which the investigation concerns, to become conversant with all the other lines of approach, apart from the one in which he happens to specialise, to the problems which a study of food, agricultural, and mineral production raises. Much of what follows should therefore be regarded as tentative rather than conclusive: the present writer makes no claim to be an "authority," but hopes that the suggestions and comments here made may stimulate others to follow up all the available clues.

Reference to the charts will show that in some cases lines of secular trend have been computed for the production indexes. It was originally intended to carry out this work in the case of all group and combined indexes. Unfortunately the time limit set on this study has made this impossible. If another edition is issued these gaps will be closed.

The tables and charts for cereals, after registering marked rises in the pre-war and war periods (omitting barley for the moment) have shown since 1920 what may perhaps be best described as a halting tendency. This is highly important. Cereals play an extraordinarily large part in agriculture and food and the welfare of the agricultural classes is intimately bound up with the conditions of production and prices in the cereal market.

In the case of barley we may speak of a receding rather than a halting tendency.

Beans show a fairly stationary condition since 1901, except for the two years 1920-1921. Since 1921 they have tended to decline. Potatoes show a receding tendency since 1919: only in two years since then has production exceeded the amount reached in the preceding year.

The above tendencies derive added significance from the widespread unrest among the agricultural classes in Japan in recent years. They justify the intense interest in food, agricultural, and population questions which is evident on all hands in Japan today. They justify the appointment of the Government Commission of Enquiry into the Food and Population Problems.

Turning to the table and chart showing the course of animal foodstuffs we find a very marked upward tendency since 1905. In the earlier part of the period fish show the most rapid increase, but since 1920 the others—meat, eggs, and milk—have increased more rapidly. However it should be noted that fish is by far the most important constituent in the group.

In the Combined Food indexes, what we may on the most optimistic estimate describe as a slowing-up in the rate of increase is most evident after 1920. If it were not for animal foodstuffs this would be more marked, a fact which gives point to the criticisms made by the Editor of the Tokyo Journal, *"The Japan Advertiser,"* of foreign books on Japan which discuss the food supply with too exclusive attention to rice. Every effort has been made to avoid this error in the present study. Some Japanese observers, however, consider that the production data in the case of fisheries represent under-estimates. If this is so, then so far as under-estimation is in constant proportion in different years to the true data, the comparative validity of the series of relatives and the group index number of animal foodstuffs will remain. Relatives and index numbers do not pretend to give absolute amounts: all that they do is to give comparisons between amounts at different intervals of time. But there is one respect in which the food index numbers would be affected. Under-estimates would reduce the weight given to the fishery group, since that weight is decided by the values in the base period. This would reduce the influence of the animal foodstuffs group on the total food index. However, there is at present no means of checking the estimates: something in the nature of a census of production is desirable.

The Imports of Food Index shows a remarkably steep rise in the post-war period, in respect of all three sources of supply. The significance of this will be discussed below.

Before dealing with the practical bearing of the results revealed above it will be appropriate to bring in line at this point the more important of the conclusions reached by students of the qualitative aspect of the food problem in Japan, in so far as the quantitative results here obtained have any bearing on these conclusions. In the last few years especially, important studies have been carried on into the quality of Japanese food, at the Institute of Nutrition in Tokyo and at other centres, by Dr. Tadasu Saiki and other Japanese workers. For English language readers a valuable discussion is contained in "The Food of Japan" by Dr. E. C. Grey, published in the series issued by the Health Organisation of the League of Nations. Dr. Grey carried out a comprehensive analysis of Japanese foods, with important results.

One of the most important conclusions reached is that Japanese diet is deficient in protein and the proportion of carbohydrate to protein is unduly high. This is largely due to the preponderance of rice and the deficiency of animal foodstuffs in the diet.

Analysis shows that rice has a lower proportion of protein and a higher proportion of carbohydrates than the other chief cereals contain. A change

from rice to other cereals is recommended in some quarters as one means of correcting the protein deficiency. The present quantitative study, however, gives little ground for hope that in the near future there will be any substantial increase in the production of the cereals other than rice. In spite of the halting tendency in rice production in the post-war period there is no sign of great increase in the production of any other cereal. For some years barley has been stationary or declining in tendency. Wheat shows very little tendency to increase and in any case is of small dimensions. No other cereal can be seriously considered.

Next, beans may be considered as a source of protein. Very optimistic views have been expressed by writers in the Year Book of the Department of Agriculture in the United States and by Dr. J. H. Kellogg, on the protein value of the soy bean, and these views have received wide currency through quotation in J. Russell Smith's able and well known work.[1] These views, however, seem to be flatly contradicted by the results of Dr. Grey's analysis and of experiments carried out by Japanese investigators. Possibly the explanation is that investigators in America carried out an analysis of beans in the raw state, investigators in Japan of products made from the bean. In their raw state soy beans are extremely hard and before they can be converted into food products must receive prolonged cooking. However this may be, the production of beans in Japan has been stationary or declining in the period since 1921, showing increases in two years and decreases in four. In the same period, however, imports show a marked increase.

Examination of the relevant tables and charts shows a more promising tendency in animal foodstuffs. It is clear that from the viewpoint of food supply the sea is an important supplement to the land in the case of Japan. The number of persons engaged in Japanese fisheries in 1927 was 1,479,776. Of these, 1,125,983 were engaged in actual fishing. This represents an important section of the employed population. In 1927, 489,611 were classified as employers and 637,372 as employees. The unit of operation thus appears to be very small and contrasts with the more capitalistic operation in Great Britain. But some change is noticeable in 1927 as compared with 1921, when there were 539,381 employers and 595,819 employees. The question inevitably arises whether or not much larger units of operation, with more capital, would reduce costs of production and ensure a more regular supply of fish. Notification No. 27 issued in 1912 by the then Department of Agriculture and Commerce, revised subsequently in five different years, draws out in detail a zone within which trawling is prohibited. The area is a considerable one in places. Prohibited areas must sometimes be established for a time to prevent destruction of young fish and eggs, but so far as they are motivated by a desire to protect coastal non-trawl fishermen from the competition of trawlers they are in the same category as attempts to prevent the introduction of new

[1] J. Russell Smith, *The World's Food Resources*, Holt, 1919, New York.

machinery on the ground that it creates unemployment. They suggest over-population in the occupation concerned and a need for a scheme of transference.

It is sometimes suggested that as meat contains a higher percentage of protein and is less subject to fluctuations in production, increased consumption of meat in Japan would be the most desirable form of increasing the supply of protein. But the production of meat is an expensive way of supplying food calories, more especially from the viewpoint of the amount of land utilised. Given two equal areas of land subject to similar conditions, one devoted to producing plant foodstuffs to be consumed directly by man will produce more food calories and support more people than one devoted to producing meat for human food.

In the case of so densely populated a land as Japan, economy of land is vital. Japan is a country of many people and few animals. In 1927 there were only 0.02 cattle per head of population and only 0.003 sheep. It is clear that any appreciable extension of the area devoted to raising animal foodstuffs, with the possible exception of certain hitherto unused mountain slopes, must inevitably reduce, or prevent from increasing, the area devoted to producing plant foodstuffs for direct human consumption. This in turn must lead to a reduction in the total number of food calories available for the Japanese people.

The tentative conclusion emerges that an increase in the supply of protein in Japanese diet will be difficult to obtain from the home land alone and that the most promising sources of supply are the sea and other countries. If the halting tendency in the production of many of the plant foodstuffs, which is traceable since 1920, continues, the same conclusion will come to apply, not only to foodstuffs of high protein content, but to foodstuffs as a whole.

This raises the question of fiscal policy in its most acute form. At present there are certain taxes and more indirect means of restricting imports. A detailed study of these measures is now being carried out by the Osaka Association for Liberty of Trading, and the present writer hopes to review the conclusions later in an English article. Here we may briefly consider the issues involved.

Japanese agriculture has sometimes not inaptly been described as gardening rather than farming. The Ministry of Agriculture's classification of the number of farm households according to the extent of area managed showed that in 1927, out of 5,561,608 farm households, 1,944,523 managed areas less than 5 tan[1], 1,895,837 areas of less than 1 cho[2], 1,195,332 less than 2 cho, 321,741 areas less than 3 cho, 133,661 areas less than 5 cho, and 70,514 areas of more than 5 cho.

There is therefore a general presumption that Japanese agriculture is more likely to be over-populated than under-populated, and that the returns

[1] *tan* = 9.91736 *are*. [2] *cho* = 0.99174 *hectare*.

per unit of effort would be much greater if farms were larger. The use of mechanical methods is gravely hindered by present conditions: the Japanese farmer works with far less assistance from capital instruments than is the case with North American and many European farmers. A comparison between conditions prevailing in Japan and those prevailing in some of the rice regions in the United States reveals this difference in a strong light, though of course it must not be hastily assumed that machinery can be applied on the same scale to rice cultivation in all kinds of soil.

The background behind our study of production is therefore not a bright one if we are considering the possibility of supplying an increasing population with food from home sources. The conclusion is tentatively suggested here that Japan is probably destined to pass through the same stage in the twentieth century that England passed through in the nineteenth, and that she will as the century goes on become dependent on imports for a considerable portion of her supply. The halting tendency of many home-produced foodstuffs, the sharp increase of imports, and the background of tiny farming units, all support this view.

Those who point out what a small proportion of the total food supply is imported at present, and who use this fact to support the view that home sources are adequate, overlook two things. First, direction as well as absolute amount is important. Second, but for the protectionist policy in Japan the halting tendency of home production and the upward trend of food imports would be somewhat accentuated. Neither in regard to food nor in regard to minerals do the curves represent conditions of free competition between domestic and outside sources of production. Not only are food imports restricted by taxation and by indirect methods, but also the protectionist system as a whole restricts exchange as a whole and among the commodities the exchange of which is thus restricted, food probably plays some part.

Japan cannot afford protectionist tariffs. In the United States, with its vast natural resources and extensive land area, protection cannot prevent a considerable rise in the standard of living. But Japan is a relatively tiny area as compared with the United States, and yet within its borders a population a little over one-half that of the United States struggles to eke out a living. In food and housing the standard of living in Japan is very markedly inferior to that in Western countries. What is needed is not that Japan should just maintain its present standard, or slowly increase it by very small increments, but that a very substantial advance should be made. Having regard to the extent of the natural resources and land area within its borders no argument is required to show that this cannot be effected by a self-contained economy, but presupposes extensive participation in world exchange of commodities. The more such participation is restricted by protectionist tariffs, the more difficult it will be to increase physical production and the national income and to raise the standard of living. The existing measures of protection, bolstered up by vested interests and supported by crudely fallacious

arguments, constitute a national danger to Japan, the removal of which should be a foremost object of intelligent opinion.

The formation of the Japan Federation of Liberty of Trading Associations, following on the International Economic Conference at Geneva in 1927, is a hopeful move. This organisation, however, contains members who are only agreed as a whole on the necessity of freer trade, and many of whom are by no means complete free traders. Hence it differs markedly from the Anti-Corn Law League in England in the nineteenth century, in that it favors reduction rather than abolition, and has a less downright, less uncompromising slogan than the English organisation had. As yet it is too early to judge the chances of success of the new Federation. So far little has been done to bring home to the masses of the people the effect of protection on the cost of living. The proletarian parties, who alone regard the welfare of the working classes as an end in itself, have somewhat neglected this aspect of policy, no doubt partly because they have so many other subjects to engage their attention in a country where the domestic policy of every government is invariably reactionary.

In studying the tables and charts of mineral as well as of food production, the influence of fiscal policy as well as that of geographical and economic factors must be considered as factors playing some part in determining the course taken by the curves.

In the earlier stages of the long index of mineral production it will be noticed that the amounts produced were very small. The mineral output starts not far from zero at the beginning of the period. The increase made is striking, but as it started from such a low point the absolute amount now reached is not great when compared with the amounts produced in other areas.

For the calculation of the trend line the period has been divided into two parts: 1877-1897 and 1898-1926. Separate lines have been fitted to each part with satisfactory results. The question inevitably arises whether the trend line for the period 1898-1926 can be justifiably extended into the future for the purpose of forecasting.

Some examination of the factors, whether geological or technical or economic, would have to precede any attempt to answer this question. Without such examination forecasting by mere extrapolation would be dangerous.

This does not mean, however, that trend curves, fitted by the methods here employed, are valueless for forecasting and are of purely historical interest. Anyone who, for example, in 1887 might have forecasted a continuation of the trend shown in a trend line calculated for the preceding ten years would have been roughly accurate so far as the next ten years were concerned. Often, as Warren M. Persons has pointed out, extrapolation of a straight line fitted according to the principle of least squares gives better

results from the forecasting point of view than do the compound interest curves or the parabola where these are applicable.

In any attempt at forecasting it must be remembered that in the metallic group copper, and in the non-metallic group coal, and to a much less extent petroleum, are the most important factors. Coal has a weight of 243 out of a total of 269 for the non-metallic group and out of a total of 338 for both groups. Copper has a weight of 43 out of a total group weight of 69 for the metallic group.

In discussing the future production of coal, one of the most important features to take into account is the post-war agreement for the regulation of output among the members of the National Coal Mining Association. Of course it is not to be supposed that this necessarily means a permanent stabilization of output near its present level. Much depends upon the conditions of demand among the industries which consume coal. An industrial revival would stimulate the demand for coal even at existing prices. However the Association will probably not allow any substantial increase of output to take place until the real price of coal shows an inclination to rise relatively to the prices of other commodities.

Allied to the restriction of home production is the agreement between the coal owners in Japan and the President of the South Manchurian Railway Company to restrict the importation of Manchurian coal into Japan. For 1927 it appears that the total amount to be imported was to be limited to 1,975,000 tons.

The explanation of this policy is that if unrestricted imports of Manchurian coal were permitted, its superior quality and lower production costs would drive out the weaker and more inefficient mining concerns in Japan, mainly in Kyushu.

Thus an examination of the curve of production of coal must take into account on the one hand the restriction of home output, which tends to prevent the curve from rising, and on the other hand the restriction of imports from Manchuria, which tends to prevent the curve from falling.

Both these restrictive agreements are designed to serve the private interests of particular groups rather than any wider social interests. The interests of the community as a whole would be better served by a thorough reorganisation of the coal industry, involving a number of amalgamations, the elimination of the marginal mines and a reformed labor policy in place of the semi-feudal attitude at present adopted by many employers and the police. Limitation of imports should be swept away, because it encourages inefficiency in Kyushu and hastens the exhaustion of home supplies, which at the present rate of consumption are not likely to last more than about three centuries. Regulation of the output of coal is by no means to be opposed in all circumstances, but when it is adopted the limited output should come from the most efficient sources of production and the interests of the consumer should be represented. None of these safeguards is provided for under pre-

sent arrangements, which ignore the interests of industries other than the coal industry. If the least efficient mines in Kyushu were closed down and the gap filled by Manchurian mines with lower costs of production, the price of coal would be lowered and industry would be benefited.

The curve showing the course of production of copper, the most important of the metallic minerals, shows a marked advance for some years before the war, followed by a steep rise during the war, due largely to export demands at a time when the belligerent countries were anxious to obtain the maximum amount procurable, regardless of price. The curve after the war shows a steep fall during the earlier part of the depression. Foreign trade tables show a great decrease of exports and increase of imports. The decrease of output occurred more among small than among large firms. There can be little doubt that amalgamations are urgently needed in the copper industry.

As in so many other industries, however, these adverse tendencies have been met, not by thorough reorganisation, but by increasing protective tariffs. In 1922 the tariff on copper was raised from Yen 1.20 to Yen 7.00 per 100 kin. Not unnaturally, this drastic increase has reduced imports and arrested the fall of the curve of home production.

On the whole, a survey of the foregoing and other factors leaves the present writer extremely doubtful whether it will be possible to continue far into the future the trend curve fitted to the period 1898-1926, and suggests that the trend in the near future will show a diminished rate of increase. It seems probable that a change of trend is imminent now or in the very near future just as it was about 1898, but in a different direction from the change experienced then.

A rise in the curve of production, whether of food or agriculture or minerals, though usually desirable and a sign of economic progress, is not always so. When the curve of production of a commodity or group of commodities rises or is prevented from falling by protective tariffs or other methods of restricting imports, that is no sign of economic progress. It is a sign that the food consumed by the people or the minerals consumed in industry, are higher priced in the area concerned than in the world market, and consumers in that area are injured by such a situation. Already this situation exists in Japan to a considerable extent, and if present policies are continued it will become intensified in the future.

APPENDICES

I

IRON ORE IN THE MINERAL INDEX

In pig iron production considerable quantities of imported ores are used. It may be thought that the inclusion in this index of mineral products made from imported ores is unjustifiable, since the index sets out to measure mineral production in Japan proper only.

But the measurement of the number of tons of ore produced is not very significant and is apt to be misleading: ores vary in metal content, some containing considerably higher percentages of metal than others. The best course would be to separate the pig iron smelted from home-produced ore from that smelted from imported ores, including the latter only in an index of manufactures and not in a mineral index. But the data are not available for such a distinction. Hence the course here adopted is the only course remaining unless we exclude this mineral entirely from the series, which would be a still more unsatisfactory proceeding.

II

A NOTE ON THE FUTURE OF THE JAPANESE BIRTH RATE

The idea seems to prevail in Western countries that Japan's birth rate is in some way abnormal. In fact, however, it has in recent years been hovering around 34 per thousand, and this figure is not markedly different from the English birth rate in the seventies and eighties of the nineteenth and the German birth rate in the early twentieth century. Judging from the recent experiences of the countries of Northwestern Europe, a birth rate of 34 may be brought down to 20 within a few decades. It is quite conceivable that this may happen in Japan in the near future. Some Western writers have conveyed the impression that the Japanese people are irreconcilably opposed to birth control. The present writer, after some study of the subject, emphatically dissents from this view. It would be irrelevant here to deal with this matter in detail, but it may be pointed out that there is nothing in Japan corresponding to the opposition put up by the Roman Catholic Church in Western countries, that the large family is not deeply rooted in Japanese history, since historians agree that the Japanese population remained practically stationary throughout the later Tokugawa epoch, and a stable population is not consistent with an average family of more than between three and four, probably not more than three in Japan, where celibacy is rare; therefore the assertion sometimes made that a large family increases the social prestige of the parents is not solidly rooted in history, is not true at all of the intelligentsia, and in the case of other classes must be modified by the fact that poverty diminishes social prestige in Japan as elsewhere; and that the condom, the occlusive cap, the quinine pessary, and of course the vaginal douche are all manufactured in Japan and can be bought without restriction.

The present writer was invited to submit a statement to the Population Commission on contraceptive appliances used in English birth control clinics, and when the list and specimens were examined it was found that all but one had a counterpart of Japanese manufacture in Japan. The writer has examined very good occlusive caps of Japanese manufacture. The one exception was the Dutch Mensinga pessary, and this must be admitted to be an important exception, since it is a major appliance in English clinical practice.

The only serious opposition to contraception comes from extreme nationalist sentiment and has much diminished in recent years. A great practical hindrance lies in the censorship of books, from which passages giving precise instruction in the use of appliances are often deleted. However, even the official attitude is becoming far more reasonable on the whole subject and the present writer ventures to predict that Japan's birth rate will pass through similar, though more belated, changes to those experienced in Western countries. Hence caution should be observed in predicting the future course of population curves given in this study.

III

A MISLEADING ARTICLE

The *Japan Advertiser Annual Review* for 1928-1929 in an otherwise excellent issue contains an article (p. 17) written by an outside contributor, which handles statistics in a misleading manner which is particularly unfortunate because few English language readers can check the data. Its method is to take production in every tenth year from 1883 to 1923 and then for each year from 1923 to 1927 and supply relatives based on 1883= 100. Obviously it is absurd to take every tenth year only in the case of agricultural products if the trend is being sought. The jump from 1913 to 1923 yields deceptive results and, to the writer of the article at least, entirely obscures the peaks of production in 1919 and 1920 and the subsequent slackening or falling off. Hence we find the following dogmatic—and entirely incorrect—statements, "Rice . . . is steadily increasing in production at a more rapid rate than the population." . . . "Wheat production is expanding very quickly." Reference to the tables in the present study will quickly dispel these illusions so far as recent years are concerned.

In the case of rice it is far from evident how this writer draws the deduction mentioned, even from his own figures. From 1923 to 1927 his figures run as follows, 197, 180, 186, 194, 188.

In the case of wheat the figures given for 1925 and 1926 are 211 and 245 respectively. In reality there was an actual decrease in wheat production in 1926 as compared with 1925. In the case of rice the article gives 197 for 1923 and 180 for 1924 while in reality the crop in 1923 was 55.4 million koku and in 1924, 57.2. Furthermore the base figures are really those for 1882; not, as they profess to be, for 1883.

In the case of minerals the article states, "The available statistics include only the six years from 1921 to 1926." This is ridiculous. At the time when the article appeared the present writer's mineral index had already been published in Japanese, covering the period 1877 to 1926.

IV

CALCULATION OF TREND LINES

The straight line trends fitted to the mineral index were calculated by the method of moments. The equations

$$\Sigma y = m\Sigma x + nb, \qquad \text{and}$$
$$\Sigma xy = m\Sigma x^2 + b\Sigma x$$

where m represents the slope of the line and b the distance from zero origin to the point where a straight line cuts the vertical axis, were solved. By taking the origins at the median value, however, (1887 and 1912 respectively in the case of the two lines) the simplified forms

$$\Sigma y = nb, \qquad \text{and}$$
$$\Sigma xy = m\Sigma x^2$$

could be used. As the object was to obtain the values of b and m the following expressions were more convenient.

$$b = \frac{\Sigma y}{n} \qquad \text{and}$$

$$m = \frac{\Sigma xy}{\Sigma x^2}$$

The equations obtained were

$$y = 0.878x + 8.58$$

for the trend 1877-1897, and

$$y = 3.352x + 71.71$$

for the trend 1897-1926.

Japanese readers may find full details of calculations in my "Nihon Kosambutsu no Seisan Suryo Shisu."

V

HOME FOOD PRODUCTION AND FOOD IMPORT INDEXES COMBINED

The increase of imports of food and the halting tendency of important classes of domestic food production lend interest to a combined index showing the course of production in recent years of home produced food plus imports. The accompanying tables and charts show such a combined index and show it in comparison with the separate imports of food and home pro-

duction indexes. Trend lines have also been computed and are shown in the second of the two charts relating to this subject.

It will be seen that when the import index is added to that of home production the halting tendency shown in the latter in recent years is largely if not entirely eliminated in the combined index. Each succeeding peak in the waves of the curve is higher than the last in the combined index, but the same is not true of the domestic production index taken alone. Similarly there is a considerable difference between the equations of the trend lines computed by the method of moments, and hence between their directions. The comparisons shown indicate a tendency already at work by way of a halt or slower rate of increase in leading classes of domestic food production, and this tendency is being counteracted by a very definite tendency of food imports to increase.

These comparisons may be commended to the careful attention of those writers who have belittled the importance of food imports to Japan.

In the calculation of the combined index, Food Index II has been taken to represent domestic production, because of the gaps in Food Index III which disturb its homogeneity. But the weight appropriate to Food Index III has been applied in accordance with a well established principle adopted in combining group index numbers. Thus domestic food production is given a weight of 3,392 and food imports a weight of 558.

TABLE 33

FOOD INDEX: HOME PRODUCTION AND IMPORTS COMBINED
BASE: 1921-5 Average

	Home Production	Imports	Combined Home Production & Imports
Weights	3392	558	
1910	79.42	30.68	69.43
1911	87.20	28.65	74.51
1912	87.19	29.56	74.84
1913	87.90	36.97	77.78
1914	94.63	35.28	82.32
1915	95.36	31.72	81.63
1916	100.80	23.39	82.00
1917	95.41	25.15	79.03
1918	93.38	67.36	89.17
1919	103.37	74.94	98.78
1920	106.04	44.08	93.67
1921	95.21	72.26	91.57
1922	101.89	90.99	100.27
1923	96.33	93.63	95.94
1924	98.20	115.80	100.51
1925	105.19	116.06	106.66
1926	98.22	119.11	100.93
1927	105.24	124.02	107.71

TABLE 34

FOOD INDEX: HOME PRODUCTION AND IMPORTS COMBINED
Base in 1910

	Home Production	Imports	Combined Home Production & Imports
Weights	3392	558	
1910	100.00	100.00	100.00
1911	109.80	93.38	107.32
1912	109.78	96.35	107.79
1913	110.68	120.50	112.03
1914	119.15	114.99	118.57
1915	120.07	103.39	117.57
1916	126.92	76.24	118.10
1917	120.13	81.98	113.83
1918	117.58	219.56	128.43
1919	130.16	244.26	142.27
1920	133.52	143.68	134.91
1921	119.88	235.53	131.89
1922	128.29	296.58	144.42
1923	121.29	305.18	138.18
1924	123.65	377.44	144.76
1925	132.45	378.29	153.62
1926	123.67	388.23	145.37
1927	132.51	404.24	155.14

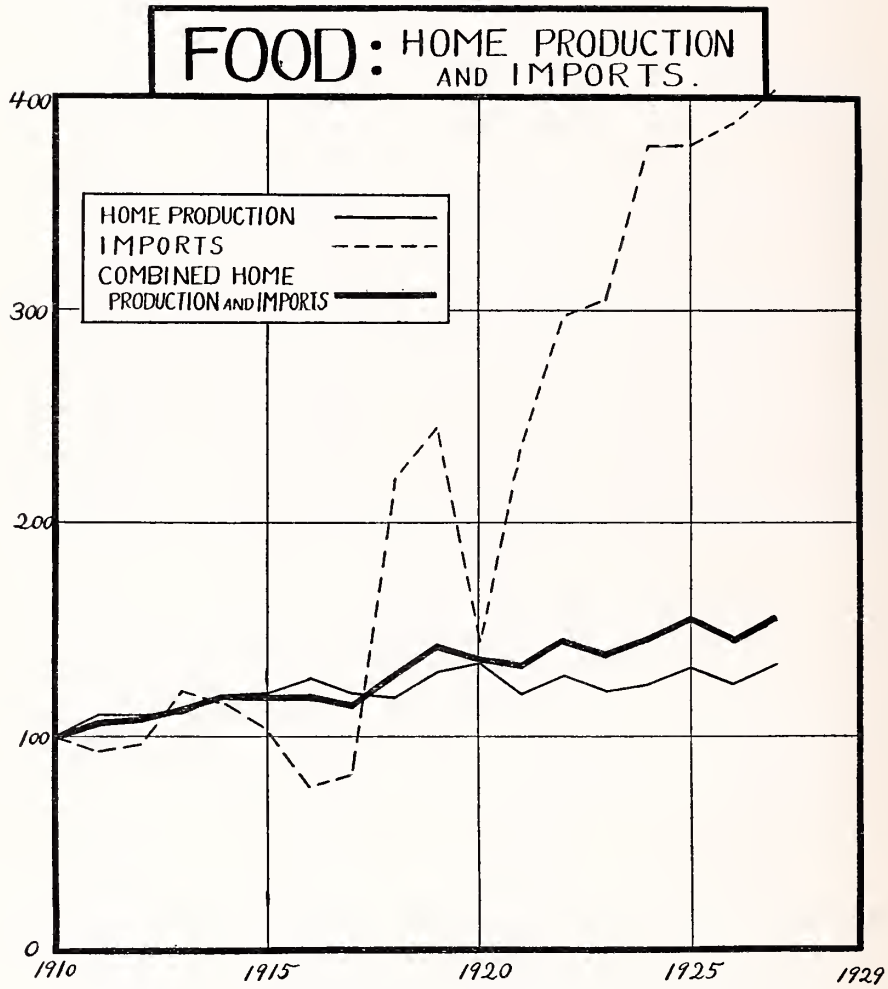
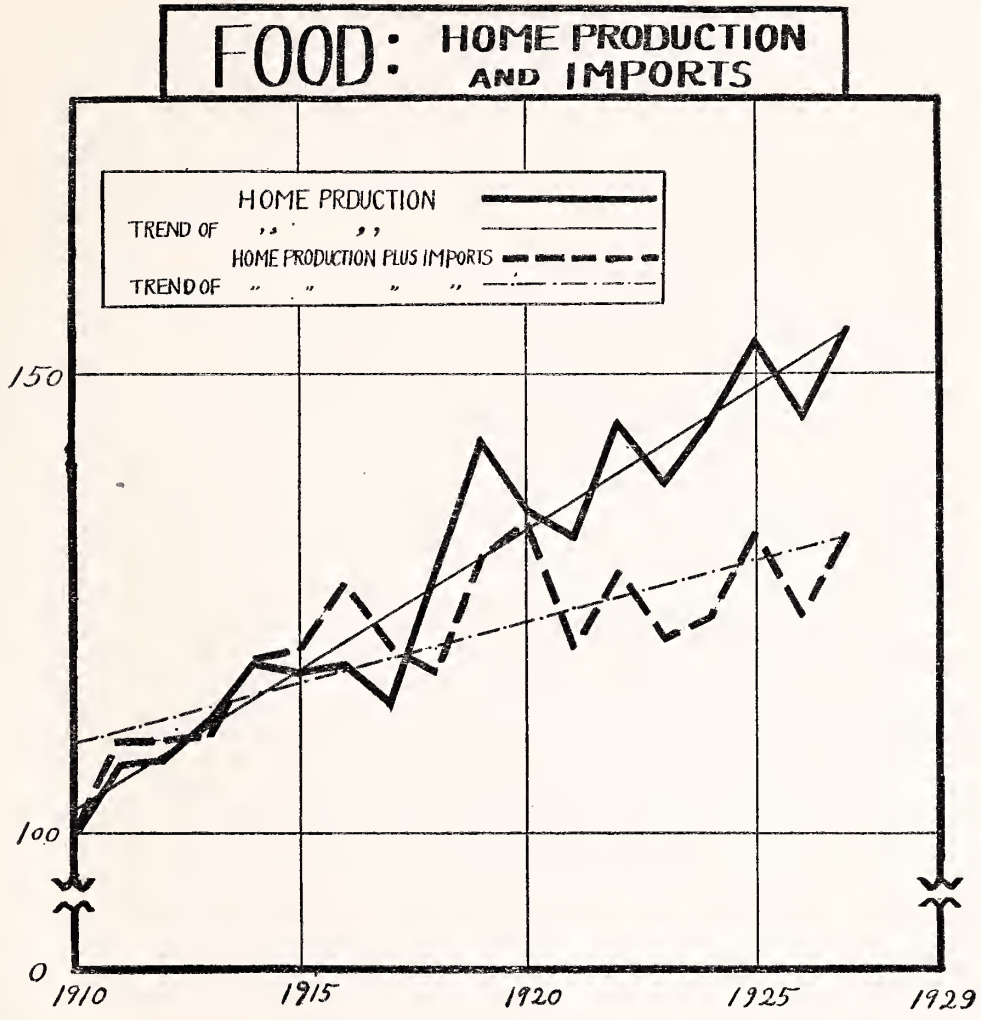


DIAGRAM K. GRAPH SHOWING HOME PRODUCTION AND IMPORTS OF FOOD



Note *Equations of Straight Lines of Trends*

Homefood Production	$Y = 0.530x + 96.17$
Homefood Production and Imports	$Y = 1.066x + 89.26$

DIAGRAM L. GRAPH SHOWING TRENDS OF HOME-FOOD PRODUCTION AND HOME-FOOD PRODUCTION AND IMPORTS